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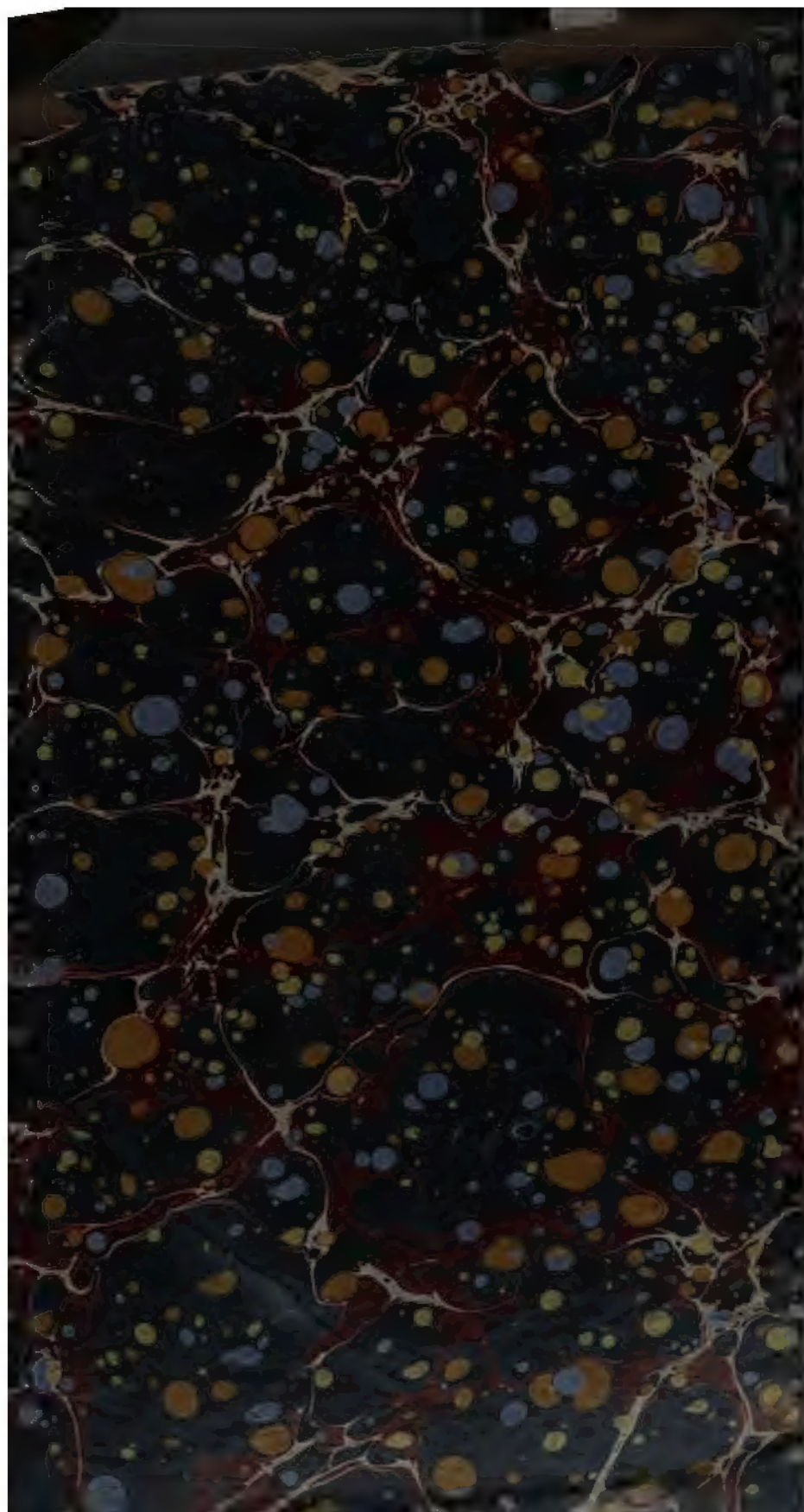
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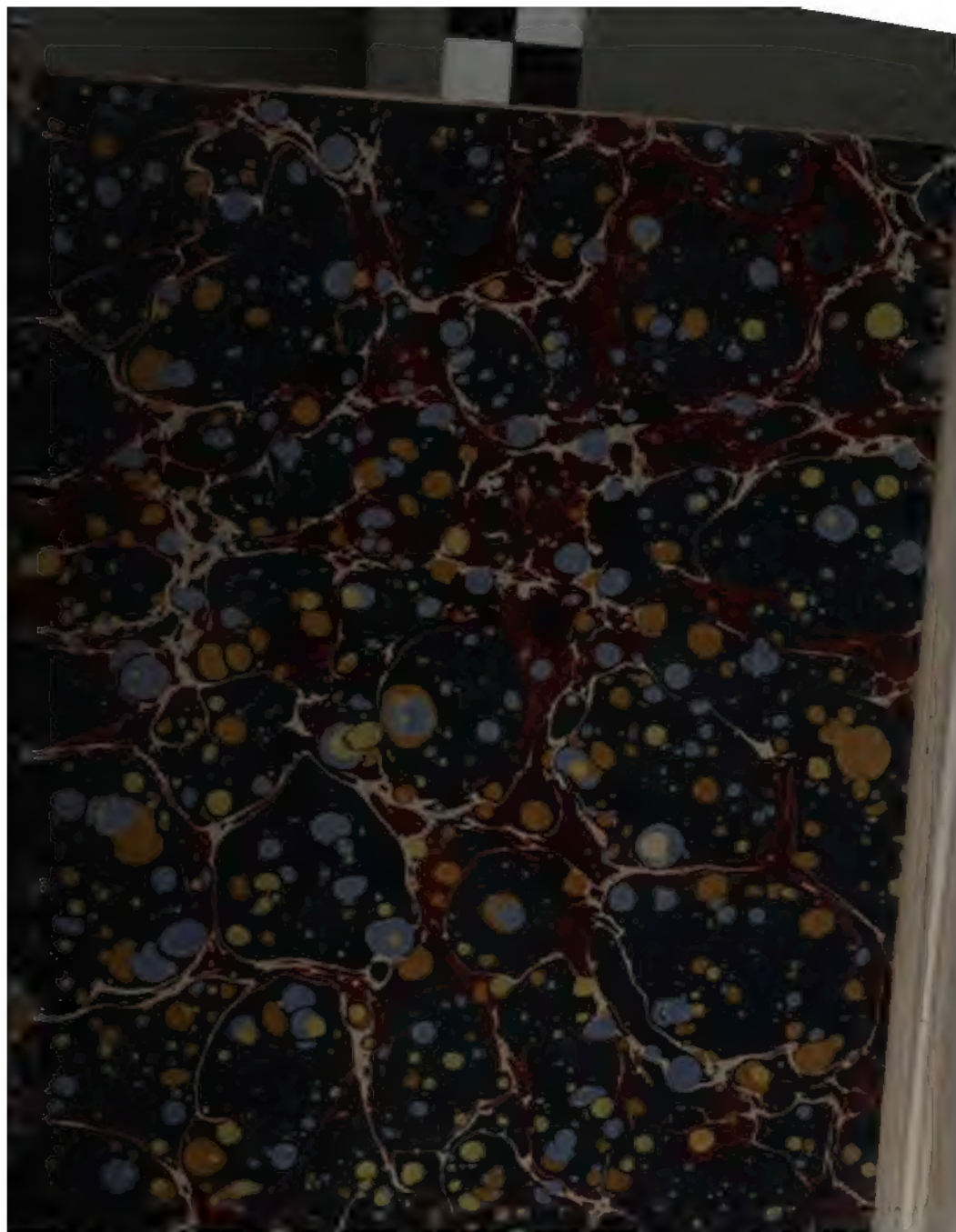
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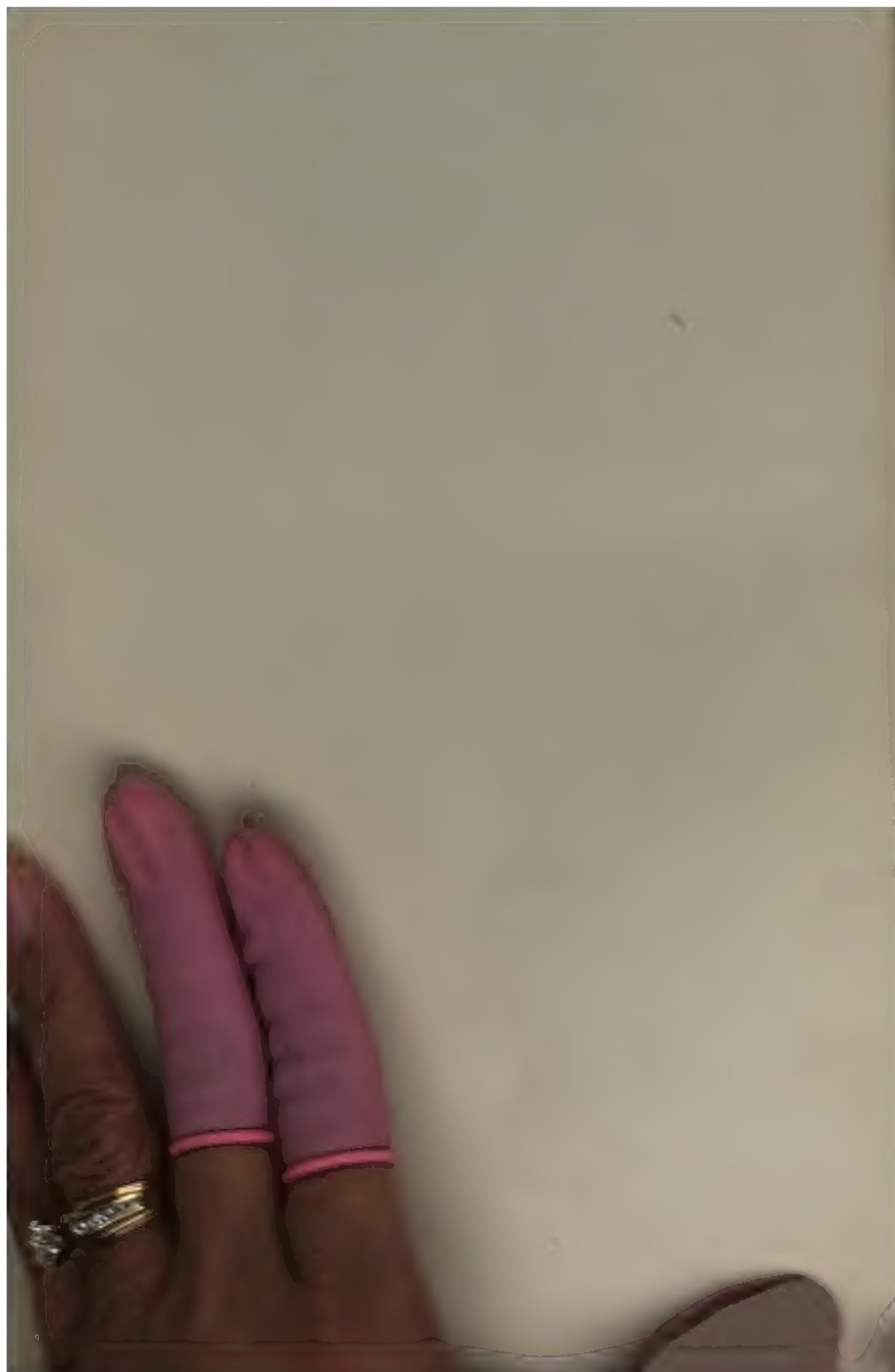




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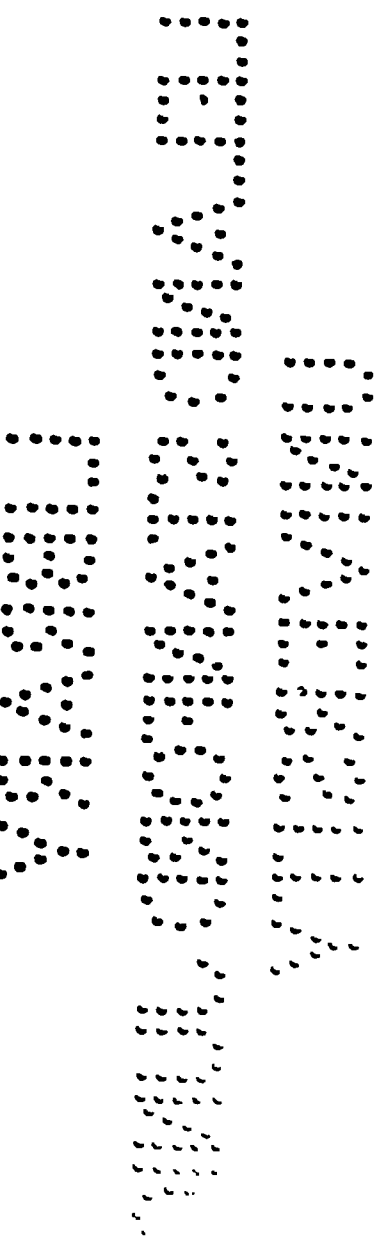
PUBLICATION
OF THE
FIELD COLUMBIAN MUSEUM

ZOÖLOGICAL SERIES

VOL. II.



CHICAGO, U. S. A.
1901



PREFACE.

This Synopsis is an attempt to bring together all the forms of North American Mammals that have been described, and which are generally considered as entitled to some kind of recognition. All those inhabiting North America and its adjacent seas between the North Pole and the United States and Mexican Boundary have been included.

It is very manifest to many Naturalists that too many forms have been given distinctive rank, and without doubt a considerable number of the so-called species and subspecies contained in this volume will eventually swell the list of synonyms, already sufficiently formidable. In late years there has been an evident inclination among some Mammalogists to unduly magnify, as it would seem, trivial dissimilarities observed among their specimens and thus greatly increase the number of slightly differentiated individuals elevated to a separate rank, at the risk of reducing the science to one founded on labels and localities, instead of distinctive and prominent characters, and thus a knowledge of the place where an example was obtained becomes at times of more importance for its identification than are the differences that may separate it from its allies. The lack of resemblances often observed among crania is frequently but the individual variations of a type, and taking these for the characters upon which to establish a new species is apt to lead into error, and in not a few instances too much reliance has been placed upon such slight differences. The same may be said of shades of color, and not a few names in this Synopsis have been given to specimens so closely alike, that one author, in speaking of his Key which was intended to be the means for distinguishing the species, has been obliged to say: "*It will be necessary to have both skins and skulls in hand, and even then it will be impossible to identify some of the forms without actual comparison with their nearest allies.*"* The scientific value of such species (?) can only be very questionable at the best, and the elevation to a separate distinctive rank of such intimately related creatures, can not be considered as helpful or beneficial to Mammalogical Science. It can be safely asserted that there is hardly a genus of North American Mammals that does not contain too many named forms, and that the science would be benefited if a considerable number were relegated

*Bailey: Revision of Am. Voles of the genus *Microtus*, N. Am. Faun., No. 17, p. 14.

to their proper place among the synonyms. The present time can not be supposed as opportune for a final and satisfactory revision of the various groups contained in this Synopsis. That must be the work of some future Mammalogist who can bring to the task not only a thoroughly unprejudiced mind, but who may have acquired a more intimate acquaintance with the quadrupeds of those sections of our country, as yet little known, and whose knowledge of geographical distribution of mammals, the extent of the individual variation of crania, the relationships that apparently different forms have for each other, and the changes in color assumed by the pelage throughout the year, and in some cases adopted by the sexes, has been gained from extensive series of specimens, much greater and more complete than those possessed by any naturalist at the present day. Then only can a list of our mammals be made that will be comparatively permanent and satisfactory. This Synopsis, therefore, may only be regarded as a starting point upon which such a final list may be founded, and does not purport to indicate how many SPECIES of mammals there are in North America, but merely to show how many forms are given some kind of a distinctive rank at the present time that are more or less recognizable, but whose ultimate scientific standing is subject to future revision and correction, and in this light the author trusts the book may be useful to his fellow workers.

An earnest effort has been made to include all described forms that are entitled to a place in this Synopsis, yet in spite of the utmost care some may have been omitted, but it is hoped they are few in number. In the descriptions of the various species and subspecies, it has been attempted to emphasize the salient characters of each form, when existing, and to contrast them with those of the nearest ally, not always, it must be acknowledged, with signal success, as in not a few instances the characters (?) have been so insignificant and obscure as not to permit of an intelligent comparison, but the best has been done that the circumstances would allow. In certain cases where two or more described forms closely resembled each other, the author's name has been quoted and his description given, so that, whatever "claims" for distinctive rank may be shown to exist, they could be presented in the most favorable light. In some instances measurements have been given of the average of a number of examples; but the majority are those of some selected specimen. As there is, of course, considerable variation among individuals of a species, allowance for this must be made, if the size of an example in hand does not entirely agree with the figures in the description of that species. Unless otherwise stated all measurements are given in millimetres.

In the arrangements of the Mammalia in this volume the order of succession has been from the lowest to the highest, and naturally commences with the Marsupials.

- ORDER I. MARSUPIALIA—Marsupials.
Fam. 1. Didelphyidae—Opossums.
- ORDER II. EDENTATA—Edentates.
Fam. 1. Dasypodidae—Armadillos.
- ORDER III. SIRENIA—Sirenians.
Fam. 1. Hydrodamalidae—Sea Cow.
Fam. 2. Manatidae—Manatees.
- ORDER IV. CETACEA—Cetaceans.
Fam. 1. Balaenidae—Baleen Whales.
Fam. 2. Physeteridae—Sperm Whales.
Fam. 3. Delphinidae—Dolphins, Porpoises, etc.
- ORDER V. UNGULATA—Hoofed Mammals.
Fam. 1. Dicotylidae—Peccaries.
Fam. 2. Cervidae—Deer.
Fam. 3. Antilocapridae—Prong-horn Antelope.
Fam. 4. Bovidae—Cattle, Sheep, etc.
- ORDER VI. RODENTIA—Rodents.
Fam. 1. Sciuridae—Squirrels, Marmots, etc.
Fam. 2. Haplodontidae—Sewellels.
Fam. 3. Castoridae—Beavers.
Fam. 4. Muridae—Rats, Mice, Voles.
Fam. 5. Geomyidae—Pouched Rats.
Fam. 6. Heteromyidae—Kangaroo Rats, Pocket Mice.
Fam. 7. Zapodidae—Jumping Mice.
Fam. 8. Erethizontidae—Porcupines.
Fam. 9. Ochotonidae—Picas—Chief Hares.
Fam. 10. Leporidae—Hares and Rabbits.
- ORDER VII. CARNIVORA—Carnivores.
Fam. 1. Felidae—Cats.
Fam. 2. Canidae—Wolves and Foxes.
Fam. 3. Ursidae—Bears.
Fam. 4. Procyonidae—Raccoons.
Fam. 5. Mustelidae—Weasels, Otters, etc.
- ORDER VIII. PINNIPEDIA—Sea Lions, etc.
Fam. 1. Otariidae—Eared Seals.
Fam. 2. Trichecidae—Walrus.
Fam. 3. Phocidae—Seals.
- ORDER IX. INSECTIVORA—Insectivores.
Fam. 1. Soricidae—Shrews.
Fam. 2. Talpidae—Moles.
- ORDER X. CHIROPTERA—Bats.
Fam. 1. Vespertilionidae—Common Bats.
Fam. 2. Phyllostomatidae—Vampire Bats.
Fam. 3. Noctilionidae—Large-eared Bats.

North America, as understood in this volume, extends from the North Pole to the boundary dividing the United States and Mexico, and it has not been attempted to give the range of any species south of the Mexican line, although some do pass it, but to restrict the description of geographical distribution to the limits mentioned, as well as to the adjacent seas. Certain forms have been described while the volume was passing through the press, too late for them to appear in their proper position in the body of the book. These will be found in the Appendix.

And now I have much pleasure in acknowledging the assistance received from various friends while engaged upon this work, and I desire to express my thanks to Dr. J. A. Allen, Curator of Vertebrate Zoölogy in the American Museum of Natural History, New York; to Dr. C. H. Merriam, Chief of the Biological Survey, Department of Agriculture, Washington; to Dr. F. W. True, Curator, and G. S. Miller, Esq., Assistant Curator of Zoölogy, United States National Museum, Washington, for the loan of skulls not contained in the Field Columbian Museum. To Witmer Stone, Esq., Curator of Zoölogy in the Academy of Natural Sciences, Philadelphia; and Dr. A. Woodward, Librarian, and I. N. Sniffen, Esq., Assistant Librarian in the New York Museum of Natural History, I am much indebted for information conveyed to me from the volumes in the fine libraries of their respective institutions. The half-tones that illustrate the volume exhibit, with but few exceptions, every genus and subgenus of North American Mammal, and the collection to which each cranium belongs, and its catalogue number, is stated in every instance.

D. G. E.

3d Jan'y, 1901.

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ERRATA.

ILLUSTRATIONS.

Page 201, Fig. 43. For Field Columbian Museum Coll., read Amer. Museum Nat. History, N. Y., Coll.

Page 240, Fig. 55. For Field Columbian Museum Coll., read U. S. Nat. Museum Coll.

Page 323. For Fig. 46, read Fig. 64.

Page 387, Fig. 77. For *Neurotrichus gibbsii*, read *Neürotrichus gibbsi*.

TEXT.

Page 33. 7th line from top for Incisor, read Incisors.

Page 49. 13th line from top for males, read male.

Page 97. 15th line from top for *e. annectans*, read *e. annectens*.

Page 305. Top line for *b. macrurus*, read *b. macrura*.

Page 310. 9th line from bottom for scarsely, read scarcely.

Page 382. 4th line from top for *Sorieiscus*, read *Soriciscus*.

CLASS MAMMALIA.

Order I. **Marsupialia.**

Fam. I. **Didelphyidae.**

Limbs rather short; feet with five distinct toes; tail prehensile. Pouch sometimes present. Habits arboreal.

1. **Didelphys.**

$$I. \frac{5-5}{4-4}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{4-4}{4-4} = 50.$$

Didelphys. Linn. Syst. Nat., 1758, 1, p. 54. Type *D. marsupialis*. Linn.

Feet with five distinct toes, all provided with nails except the first toe of the hind foot, which is large, opposed to the others in grasping, and is without a nail. Tail long, prehensile, partly naked. Pouch complete. Long bristle-like hairs mingle with the fur. Incisors small and pointed, canines large. Premolars with compressed, pointed crowns.

1. **virginiana.** (*Didelphys*), Kerr, Linn. Anim. King., 1792, p. 193.

Type locality. Virginia.

Geogr. Distr. New York on the Atlantic coast to Florida and west to Mississippi and Texas.

Genl. Char. Same as those of the genus. Hoary; toes white half way from claws.

Color. Under fur white; upper parts covered with black and white hairs, the latter the longer and giving a hoary or whitish appearance; head yellowish white, pure white on cheeks, blackish on top of head and around the eyes; beneath dusky, with white hairs intermixed; legs and feet black; tail black at base, remainder yellowish white; ears black with yellow spot on upper edge. Toes of fore feet white halfway from claws; those of hind feet white at base of claws.

Measurements. Total length, 736; tail vertebræ, 381; hind foot, 75; ear height from crown, 51.

a. — pigra. (*Didelphys*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 172.

Type locality. Oak Lodge, Florida.

Geogr. Distr. Florida and coast of Georgia.

Genl. Char. Exactly like the typical species. Tail longer?

Color. Same as *D. virginiana*.

Measurements. Total length, 762; tail vertebræ, 330; hind foot, 66.



FIG. 1. DIDELPHYS VIRGINIANA.

No. 465 Field Columbian Museum Coll. $\frac{2}{3}$ nat. size.

2. californica. (*Didelphys*), Bennett, Proc. Zool. Soc., 1833, p. 40.

Type locality. Northwestern Mexico, adjacent to California.

Geogr. Distr. California, Texas, Oklahoma Territory, Mexico.

Genl. Char. Black; toes reddish, white half way from claws.

Color. Upper parts and side black with occasional white hairs mostly on dorsal region; face and forehead whitish around the eyes, line in the center of the crown black; beneath white shaded with dusky; legs and feet black, toes reddish white half way from claws on fore feet, only at base of claws on hind feet. Tail black at base, remainder white.

Measurements. Total length, 640; tail vertebræ, 250; hind foot, 59.

Order II. **Edentata.**

Fam. I. **Dasypodidae.**

Body covered with a bony carapace, containing seven to nine movable rings in the center and on the sides; head narrow; snout long, narrow, obliquely truncated; pterygoids meeting below nasal passage; ears long, ovate, erect, placed on occiput, contiguous; body elongate, narrow; tail long, tapering, dermal scutes forming distinct rings. Front feet with four toes, hind feet with five, all with strong, curved, pointed nails.

2. Cabassous.

$$M. \frac{8-8}{8-8} \text{ or } \frac{7-7}{7-7} = 32 \text{ or } 28.$$

Cabassous. McMurtr. Cuv. Anim. King., Am. ed. 1831, 1, p. 164. Type *Dasypus uni-cinctus*, Linn.?

Tatusia. Less. Man. Mamm., 1827, p. 309.

One pair of inguinal, and one pair of pectoral mammæ; other characters similar to those of the Family.

3. novem-cinctus. (*Dasypus*), Linn. Syst. Nat., 1766, 1, p. 54.

octo-cinctus, (Linn). Schrieb. Säugt., 11, 1775, p. 222, tab., lxxiii, lxxvi.

peba, Desm. Mamm., 1820, p. 368.

longicaudus, Wied, Breit. Naturg. Bras., 1825, 11, p. 531.

mexicanus fenestratus, Peters, M-B. Akad. Berl., 1864, p. 180.

leptorhyncha, Gray, Handl. Edent., 1873, p. 14, pl. 2, figs. 3, 4.

Type locality. "America meridionali."

Geogr. Distr. Texas, south through Mexico and Central America to Paraguay.

Genl. Char. Tail as long as body without head; shield with eight movable rings in the middle, and nine on the sides. Tail covered by twelve rings, and not enveloped in a cone. Molars 32.

Color. Skin of face flesh-color with a few yellowish hairs. Head shield pale brown; shield of back black, with the scales on sides yellowish white. Tail brownish black, anterior half of scales yellowish white. Ears brown; toes yellowish, claws white.

Measurements. Total length, 237; tail vertebræ, 90; hind foot, 31; ear, 22; length of shell, 318; width of shell, 394.



CABASSOUS NOVEM-CINCTUS.

No. 114 Field Columbian Museum Coll. Nat. size.



HYDRODAMALIS GIGAS.

No. 22184 U. S. National Museum Coll. 1 nat. size.

Order III. **Sirenia.**

Fam. I. **Hydrodamalidae.**

Cervical vertebræ six only; rostrum narrow, formed by union of the premaxillæ in front of the anterior narial aperture; tail rounded; rudimentary nails on fore limbs; no trace of hind limbs externally or internally; fore limbs flattened oval paddles; upper lip cleft in the middle into two lobes independently movable, approaching each other or receding simultaneously.

3. **Hydrodamalis.**

Hydrodamalis. Retizius, Kongl. Vetensk. Acad. nya. Handlingar, Stockholm, 1794, p. 292. Type *R. gigas*, Zimm.

Rhytinas. Ill. Prodr. Syst. Mamm. et Av., 1811, p. 141.

No teeth; head very small, comparatively; pectoral limbs small, truncated; tail with two pointed lobes; skin naked; epidermis thick, bark-like; vertebræ, 60-63. Species extinct.

4. **gigas.** (*Manatus*), Zimm. Geogr. Gesch., 1780, 11, p. 426, fig. 5.
Type locality. Bering Island.

Genl. Char. Size very large; fore limb covered with short brush-like hairs.

Geogr. Distr. Copper and Bering Islands, Bering Sea.

Color. Dark brown, sometimes spotted or streaked with white.

Measurements. Total length, 20-25 feet Basal length of skull, 660; Hensel, 560. Zygomatic width, 340; height at occiput, 160; least interorbital width, 90; occiput to anterior end of frontal, 300. Skull much broken. Spec. No. 22184 U. S. Nat. Mus. Coll.

Fam. II. **Manatidae.**

4. **Manatus.**

I. $\frac{2-2}{2-2}$; M. $\frac{6-6}{6-6}$ to $\frac{11-11}{11-11}=32$ or 52.

Manatus. Storr, Prodr., Meth. Mamm., 1780, p. 41.

Skull arched, descending rapidly anteriorly from frontals to nasals; zygomata large and massive; jugal greatly developed. Orbit small, prominent, almost enclosed by bone; anterior nares lozenge-shaped extending behind orbits. The mandible is massive, with a

horny plate attached anteriorly which supplies the place of teeth. Molar teeth in both jaws similar in character, square, enameled crowns elevated in transverse tuberculated ridges; those in the upper rows having two ridges and three roots, those in the lower three ridges and two roots.

5. latirostris. (*Manatus*), Harl. Journ. Acad. Nat. Sci. Phil., 1823, p. 390.

manatus, (Trichecus). Linn. Syst. Nat., 1766, p. 49.

australis, Tilesius, Jahrb. Naturg., 1, 1802, p. 23.

americanus, Desm. Dict. Hist. Nat., 1817, p. 262, pl. 96, (Part).

fluviatilis, Illig. Wagn. S. S. S., pl. 279.

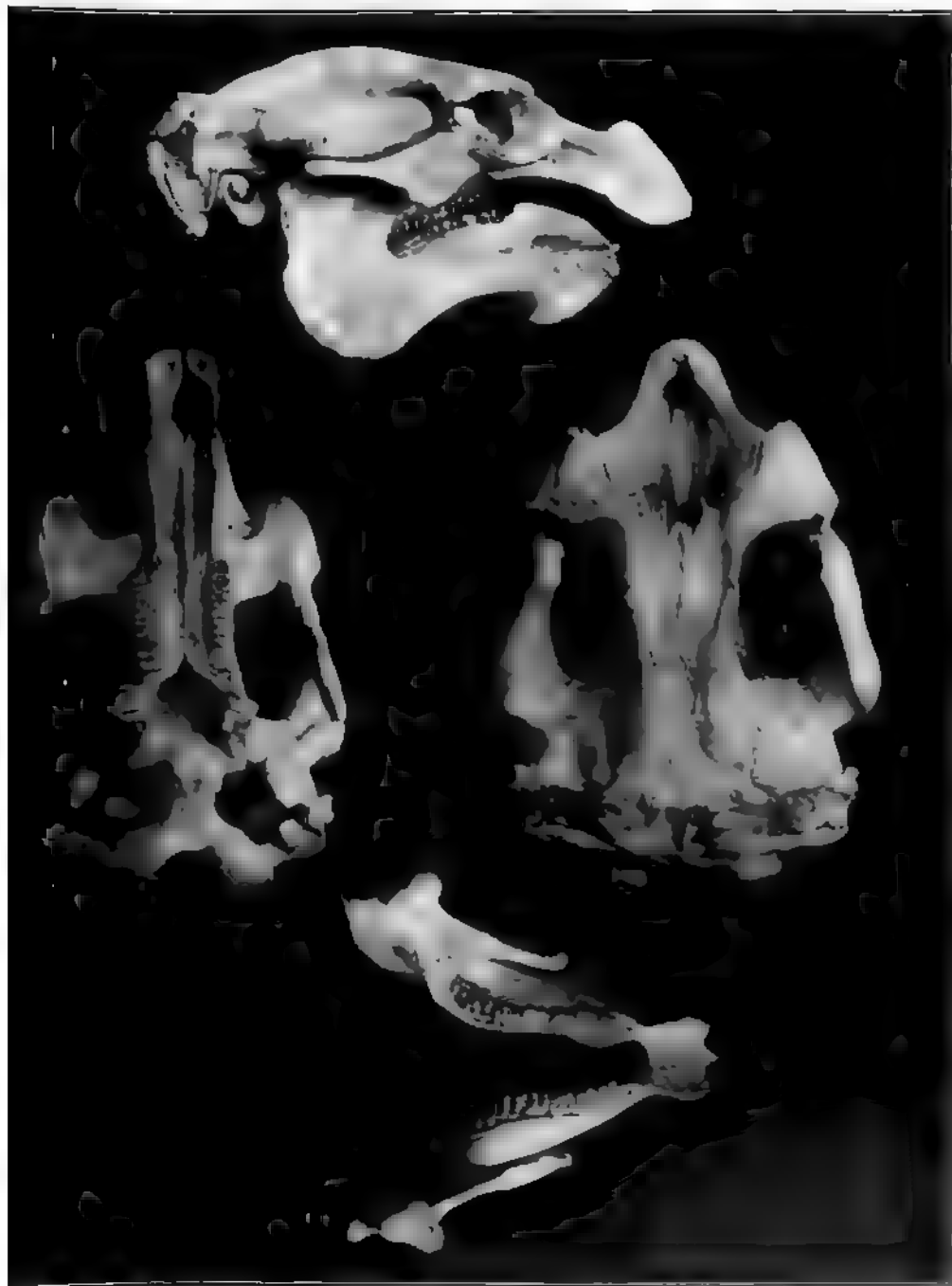
Type locality. East coast of Florida near the Cape.

Geog. Distr. Florida coast.

Genl. Char. Those of the genus.

Color. Grayish black over all the body.

Measurements. Total length, 2268. Skin. Skull: total length, 13.5 in.; width of occiput, 7.4; occipital crest to superior border of the nares, 5.5; length of opening of anterior nares, 6.3; width of same, 4.3.



MANATUS LATIROSTRIS.
No. 9 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.



Order IV. **Cetacea.**

Fam. I. **Balaenidae.**

F. W. True. *On the nomenclature of the whalebone whales of the tenth edition of Linnaeus, Systema, Naturæ.* Proc. U. S. Nat. Mus., 1898, p. 617.

Teeth absent in both jaws; present in foetal life; palate furnished with "whalebone." Rami of mandible greatly arched outwards, meeting at an angle at apex, there connected by fibrous tissues. Skull symmetrical. Ribs joined to the vertebræ usually by ligaments; first pair alone joined to the sternum. Nasals roofing the anterior nasal passages.

5. **Balaena.**

Balaena. Linn. Syst. Nat., 1766, 1, p. 105. Type. *B mysticetus*, Linn.

Leibalaena. Eschr. Nord. Wallth, 1849, p. 7.

Eubalana. Gray, Proc. Zool. Soc., 1864, p. 201.

Hunterius. Gray, Ann. Mag. Nat. Hist., 1864, xiv, p. 349. Id. Cat. Seals and Whales, 1866, p. 98.

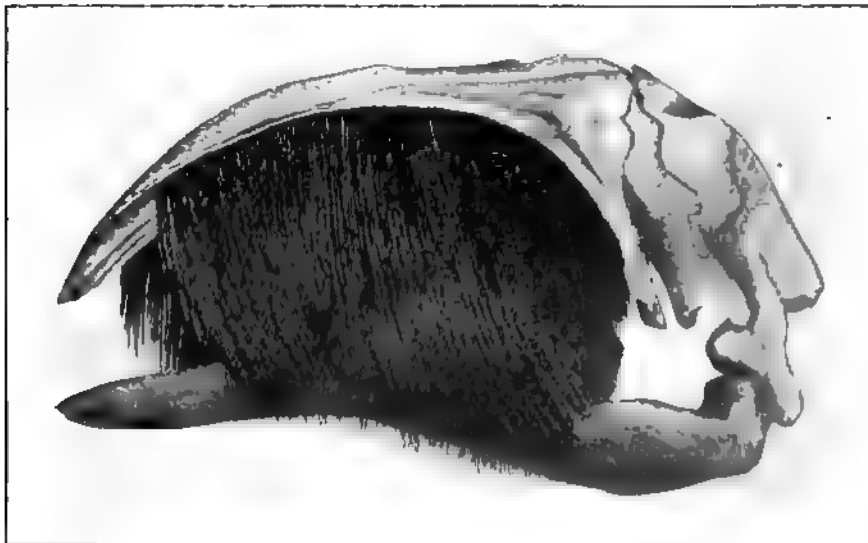


FIG. 2. *BALAENA GLACIALIS*.—BALEEN
From "The Riverside Natural History"

Macleayius. Gray, Cat. Seals and Whales, 1866, p. 78.

Head very large, one third of the total length; opening of the mouth extending behind blow holes; eyes very small; pectorals short, broad, heavy; cervical vertebræ united into one bone. Baleen very long, sometimes 12 feet, slender, elastic. Dorsal fin absent; vertebræ, 22.

6. glacialis. (*Balæna*), Bonnat. Tab. Encycl. and Méthod. des Trois Règnes de la Nature, Cétologie, 1789, p. 3.

biscayensis, Eschricht, Rev. and Mag. Zool., 2d Ser. 1860, p. 229.

australis, Gray, Proc. Zool. Soc., 1864, p. 202.

cisarctica, Cope, Proc. Acad. Nat. Sci. Phil., 1865, p. 169.

britannicus, Gray, Ann. Mag. Nat. Hist., 1870, p. 198.

australis var *biscayensis*, Lydekk. Brit. Mamm., 1895, p. 260.

Type locality. Coast of Maryland.

Geogr. Distr. North Atlantic Ocean, south to Maryland on American coast.

Genl. Char. No dorsal fin; no longitudinal furrows on throat or chest; head small; baleen short; margin of upper lip greatly curved; ribs 15 pairs.

Color. Black.

Measurements. Total length about 30 feet.

7. sieboldii. (*Eubalæna*), Gray, Ann. and Mag. Nat. Hist., 1864, p. 349.

antarctica, Schleg. Abte. Geb., 1841, page 37, (Part).

australis, Temm. (nec Desmoul). Faun. Japan, Mamm., 1842, pls. 28, 29.

aleoutiensis, Van Ben. Bull. Acad. Belg., xxv, 1868, p. 16.

Type locality. Coast of Japan.

Geogr. Distr. North Pacific Ocean, Bering Sea, coast of North America from California to the Aleutian Islands westward to longitude 150°.

Genl. Char. Resembles *B. mysticetus*, but has a large rough protuberance upon the end of the upper jaw. Superior outline of head not so convex, and corrugated transversely. Wart-like bunches on lips and head. Baleen short, coarse.

Color. Usually black, occasionally pied individuals are seen; and there is often white on throat and pectorals.

Measurements. Total length from 60 to 70 feet.

8. mysticetus. (*Balæna*), Linn. Faun. Suecica, 1761, 11, p. 16.

grænlandica, Linn. Mus. Ad. Frid., 1, p. 51.

? *nittekajensis*, Malmg, Bihang. Svensk. AK. Handl., 1883, viii,

Type locality. Greenland Seas.

Geogr. Distr. Arctic Ocean, Bering Sea, south to N. latitude 64° on east coast of Greenland, and coast of Labrador; in Bering Sea to N. latitude 55°, and in sea of Okhotsk, to latitude 54°.

Genl. Char. Head very large, more than one-third the entire length; upper jaw narrow but highly arched; rami of mandible widely spread posteriorly. Baleen very long, sometimes 10 to 12 feet, highly elastic, frayed at ends into long soft hairs. Vertebræ, 55.

Color. Black, with more or less white about the throat and fins; old individuals are of a brown color.

Measurements. Total length, 50 to 65 feet.

9. kuzira. (*Megaptera*), Gray, Cat. Seals and Whales, 1866, p. 130.

callamak, Pall. Zoog. Ross. Asiat., 1831, 1, p. 288.

antarctica, Temm. (nec F. Cuv). Faun. Japan, 1842, p. 21, pl. 30.

australis, Schrenck, (nec Gray), Reis. Amur-Land, 1858, 1, p. 193.

Type locality. Coast of Japan.

Geogr. Distr. Japan Seas, North Pacific, Bering Sea.

Genl. Char. Head small, narrow, pointed; pectoral short.

Color. Black, belly whitish, sides white spotted.

6. Rachianectes.

Rachianectes. Cope, Proc. Acad. Nat. Scien. Phil., 1869, p. 15. Type *A. glaucus*, Cope.

Head small; body elongated; pectoral fin narrow; dorsal fin absent; skin of throat smooth. Baleen short and coarse.

10 glaucus. (*Agaphelus*), Cope, Proc. Acad. Nat. Scien. Phil., 1868, p. 225.

Type locality. Coast of California.

Geogr. Distr. North Pacific and Arctic Oceans, Okhotsk and Bering Seas. Coast of California to the Arctic.

Genl. Char. Superior outline of head convex; size moderately large.

Color. Mottled gray, sometimes blackish.

Measurements. Total length, 35 to 40 feet.

7. Megaptera.

Megaptera. Gray, Ann. and Mag. Nat. Hist., 1864, pp. 207, 350.

Type *M. longimana*, Gray.

Kyphobalæna. Eschr. Nord. Wallth., 1845.

Megapteron. Gray, Zool. Erebus and Terror, 1846, p. 61.

Megapteropsis. Van Ben. Nouv. Mem. Acad. Brux., 1861, p. 38.

Pæscopia. Gray. Proc. Zool. Soc., 1864, p. 207.

Head moderate; baleen short, broad; skin of throat plicated or folded; pectorals long and narrow, one-fourth of the entire length of animal; dorsal low; vertebræ, 53; cervical vertebræ, free.

11. **nodosa**. (*Balæna*), Bonn. Cétol., 1789, p. 5.

longimana, Rudolphi, Abh. Ak. Berl., 1829, pls. 1-5.

keporkak, Eschr. K. Dansk. Vid. Selskabs. Afh., 1845, xl, p. 239, t. 1, 3, 4.

americana, Gray, Zool. Erebus and Terror, 1846, p. 17.

Geogr. Distr. Arctic and North Atlantic Oceans.

Genl. Char. Pectorals very long, their margins scalloped. Dorsal fin hump-like. Body short, thick; mandible projecting beyond upper jaw.

Color. Above black; beneath white spotted with gray; pectorals white except the base which is black.

Measurements. Total length of female 45 to 50 feet; male smaller.

α. — osphym. (*Megaptera*), Cope, Proc. Acad. Nat. Scien. Phil., 1865, pp. 178-180.

Type locality. Coast of Maine forty miles from Petit Menan lighthouse.

Geogr. Distr. Atlantic Ocean.

Genl. Char. Posterior cervical vertebræ with long inferior lateral processes; that of the fifth as long as the second; cranium broad, and one-fifth or less of the total length; fins short, one-fifth total length. Neural arches and spines of dorsal and lumbar regions greatly elevated, the vertical diameter of the centrum in the 33d vertebræ being 9.75 inches, and the height of the arch and spine 17.87 inches; the position of the zygapophysis measuring half the elevation. Ribs, 14 pairs.

Color. Only skeleton preserved.

Measurements. Total length, 50 feet. Breadth of cranium from the tips of orbital processes, 6.41 feet; between coronoids of mandible, 5.75 feet; height of scapula, 29.6 inches, breadth, 44.4 inches.

12. **versabilis**. (*Megaptera*), Cope, Proc. Acad. Nat. Scien. Phil., 1869, p. 15.

Type locality. Northwest coast of America.

Geogr. Distr. North Pacific Ocean, California to Alaska.

Genl. Char. Pectoral fins between one-third and one-fourth the total length; pectoral and gular folds 26.

Color. Above black, and in the most typical form the belly "is said to be entirely black" (Cope. l. c.); *external face of the pectorals black*.

8. Agaphelus.

Agaphelus. Cope, Proc. Acad. Nat. Scien. Phil., 1868, p. 223. Type *B. gibbosus*, Erxl.

"Fingers four, elongate, cervical vertebræ, lumbar and anterior caudal vertebræ longer than their greatest diameter. Dorsal fin wanting. Gular and pectoral region without folds. Scapula with well-developed acromion and coracoid. Baleen narrow, short."

13. gibbosus. (*Balæna*), Erxleb. Syst. Regn. Anim. Mamm., 1777, p. 610.

rostrata, Cope, Proc. Acad. Nat. Scien. Phil., 1867, p. 147, (Part).

Geogr. Distr. North Atlantic Ocean, south on North American coast to New Jersey.

Genl. Char. Mandibular ramus triangular in section with an inferior angulated ridge and a broad slightly concave face. Lamina thin, each one having two others supplementary to it, bristles of these last longer and finer; ulna slender with a prominent rounded and flattened olecranon prolonged into a thin cartilaginous plate in the plane of the ulna.

Color. Above black, beneath white; sides lead color with longitudinal shades of blackish. Fins, basal half, white, remainder black. Baleen creamy white, shaded with purple near the center of the base.

Measurements. Young about 43 feet.

Sub. Fam. I. Balaenopterinae.

9. Balaenoptera.

Balaenoptera. Lacep. Hist. Nat. Cét., 1804, p. xxxvi. Type *B. gibbar*. Desm.

Physalus. Lacep. Hist. des Cétac., 1826, p. 37.

Benedenia. Gray, Proc. Zool. Soc., 1864, p. 211.

Sibbaldus. Gray, Proc. Zool. Soc., 1864, p. 222.

Sibbaldius. Flower, Proc. Zool. Soc., 1864, p. 391.

Cuvierius. Gray, Cat. Seals and Whales, 1866, p. 164.

Head small, flat, pointed, body elongate; baleen short, broad; pectoral small, narrow, pointed; dorsal small, falcate; cervical vertebræ free; skin of throat wrinkled.

14. acuto-rostrata. (*Balaenoptera*), Lacep. Ann. Hist. Nat. Cétac., xii, v. 1, 1803-4, p. 197, pl. 8.

rostrata, Müll. Zool. Dan. Prodr., 1776, p. 7.

minor, Knox, Journ. Inst., 1834, p. 336.

mondini, Capell, Mem. Acad. Bologn., 1877, vii, pl. 1-4.

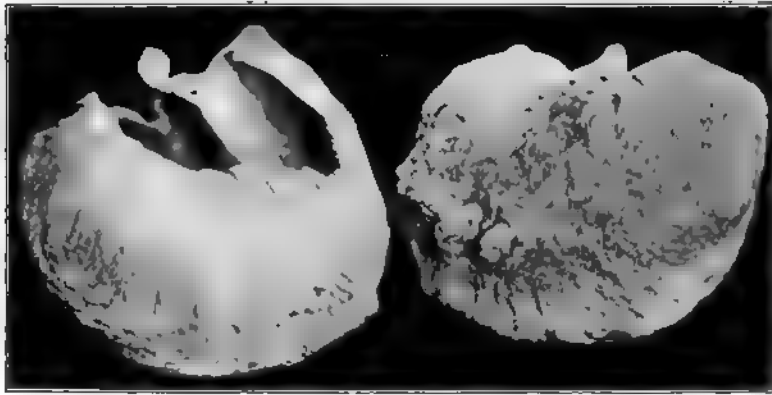


FIG. 3. TYMPANIC BONES OF BALÆNOPTERA ACUTO ROSTRATA. INNER AND OUTER SURFACE.
No. 289 Field Columbian Museum Coll.

Geogr. Distr. North Atlantic, Davis Straits.

Genl. Char. Smallest of the species; vertebræ, 48, eleven bearing ribs. Dorsal fin high, far forward on the body.

Color. Above grayish black, beneath white including inferior side of flukes; inner sides of pectorals white, and a broad white band on outer side. Baleen yellowish white.

Measurements. Total length, 30 feet.

15. davidsoni (*Balænoptera*), Scamm. Proc. Calif. Acad. Scien., 1872, iv, p. 269.

Type locality. Admiralty Inlet, coast of Washington.

Geogr. Distr. Mexico to Bering Straits, west coast of North America.

Genl. Char. Head pointed, dorsal small, falcate; pectorals small, narrow; baleen pure white. Laminæ, 270 on each side, not exceeding 10 feet in length.

Color. Above dull black, beneath white; pectoral and caudal fins black above, white beneath; a white band across pectorals near their base. Gular folds 70, milky white, interspaces pinkish.

Measurements. Total length, 27 feet; pectorals 4 feet 1 inch wide; height of dorsal 10 inches; width of flukes 7 feet 6 inches.

16. vellifera (*Balænoptera*), Cope, Proc. Acad. Nat. Scien. Phil., 1869, p. 16.

Type locality. Shores of Oregon and California.

Geogr. Distr. North Pacific Ocean; coast of California and Oregon, Commander Islands.

Genl. Char. Size large, width of flukes one-fourth total length.

Color. Above black or blackish brown, beneath milky white; baleen light lead color.

Measurements. Total length, 60 feet.

a. — copei.

borealis. Cope (nec Auct). in Scammon 303, fig. p. 37.

Type locality. Shumagin Islands, Alaska.

Geogr. Distr. Northern Seas and Aleutian Islands.

Genl Char. "Dorsal fin large and high; flukes black in some, white below in others, and in a few, white on external parts of flukes."

Color. Black above, milky white beneath.

17. physalus. (*Balæna*), Linn. Syst. Nat., 1766, 1, p. 106.

boops, Linn. Syst. Nat., 1766, 1, p. 106.

rorqual, Lacep. Cét., 1804, pp. 37, 126.

duguidi, Heddle, Proc. Zool. Soc., 1856, p. 187.

communis, Van Ben. Bull. Acad. Brux., ser. 1, 1857, 1, p. 403.

knoxii, Gray, Proc. Zool. Soc., 1864, p. 212.

Geogr. Distr. Arctic and Atlantic Oceans, Mediterranean Sea. On North American coast from Greenland to New Jersey.

Genl. Char. Flippers relatively short; baleen short, narrow. Vertebrae, 62; ribs 16 pairs.

Color. Above grayish slate, beneath white. Baleen slate color variegated with yellow and brown.

Measurements. Total length, 65 to 70 feet.

18. borealis. Less. Hist. Nat. Cét., 1828, p. 342.

Geogr. Dist. Arctic and North Atlantic Oceans, Mediterranean Sea.

Genl. Char. Size less than *B. physalus*: flippers very small, one-eleventh of total length. Vertebrae, 55; ribs 14 pairs.

Color. Above bluish black, with light colored oblong spots; beneath white. Flippers and tail black.

Measurements. Total length, 50 feet.

19. musculus. (*Balæna*), Linn. Syst. Nat., 1766, p. 106.

physalus, Pall. Zoogr. Ross. Asiat., 1830, p. 290.

sibbaldi, Gray, Proc. Zool. Soc., 1847, p. 92.

tectirostris, Cope, Proc. Acad. Nat. Scien. Phil., 1869, p. 17.

Type locality. Coast of Yorkshire, England.

Geogr. Distr. Arctic and North Atlantic Oceans.

Genl. Char. Size very large; flippers one-seventh of the total length of body. Dorsal fin small, placed far back on the body. Vertebrae, 64; ribs 16 pairs.

Color. General hue dark bluish gray, with small white spots on the breast. Baleen black.

Measurements. Total length, 80 to 85 feet.

- 20. sulfureus.** (*Sibbaldius*), Cope, Proc. Acad. Nat. Scien. Phil., 1869, p. 20.

Type locality. Northwest coast of America.

Geogr. Distr. North Pacific Ocean, Bering Sea, shores of California northward.

Genl. Char. Largest of living animals; body slender; pectorals small, short, ends rounded. Dorsal fin small, placed far back; baleen broad at base.

Color. Above light brown or brownish black, sometimes whitish; beneath yellow or sulphur hue. Baleen black or bluish black.

Measurements. Total length, 95 feet; circumference, 39 feet; length of mandible, 21 feet; longest baleen, 4 feet; weight of baleen, 800 pounds; estimated weight of animal, 147 tons (Scammon).

- 21. stynegeri.** (*Mesoplodon*), True, Proc. U. S. Nat. Mus., 1885, p. 584, pl. 25.

Type locality. Coast of the Commander Islands.

Geogr. Distr. Bering Sea.

Genl. Char. Skull: "Brain case little less than half the length of the skull. No basi-rostral groove. Premaxillary foramen posterior to the maxillary foramen. Premaxillary bones not grooved in front of the foramen, assuming a nearly vertical position anterior to the middle of the back; not greatly expanded laterally back of the nares. Occipital bone plane above the condyles, concave at the vertex. Exposed portion of vomer less than one-fifth the length of the beak." (True, l. c). Only the skull known.

Fam. II. **Physeteridae.**

Upper jaw without functional teeth; those in mandible various, number often reduced. Pterygoids meeting on the median line, and hollowed on outer side. Transverse processes of the arches of dorsal vertebræ cease near the end of the series and are replaced at a lower level by processes on the body. Costal cartilages not ossified, cranium elevated into a prominent crest behind the nares. Cranium assymmetrical around narial openings.

Sub. Fam. I. **Physeterinae.**

10. Physeter.

$$\frac{0-0}{20-20} \text{ to } \frac{0-0}{25-25} = 40 \text{ to } 50.$$

Physeter. Linn. Syst. Nat., 1766, p. 107. Type *P. macrocephalus*. Linn.

Tursio. Fleming, Phil. Zool., 1822, 11, p. 211.

Upper teeth rudimentary; lower jaw with 20 to 25 on each side, short conical, pointed and recurved; posterior and lateral edges of



HYPEROÖDON ROSTRATUS.

No. 42 Field Columbian Museum Coll. Nearly $\frac{1}{2}$ nat. size.

LOWER SURFACE.

UPPER SURFACE.

cranium raised into a compressed, semicircular crest. Cranium above concave. Rostrum elongated, its base broad and thence tapering to tip. Mandible long and narrow, the symphysis being more than half the length of the ramus. Vertebrae 50. Zygomatic process of jugular, thick, massive.

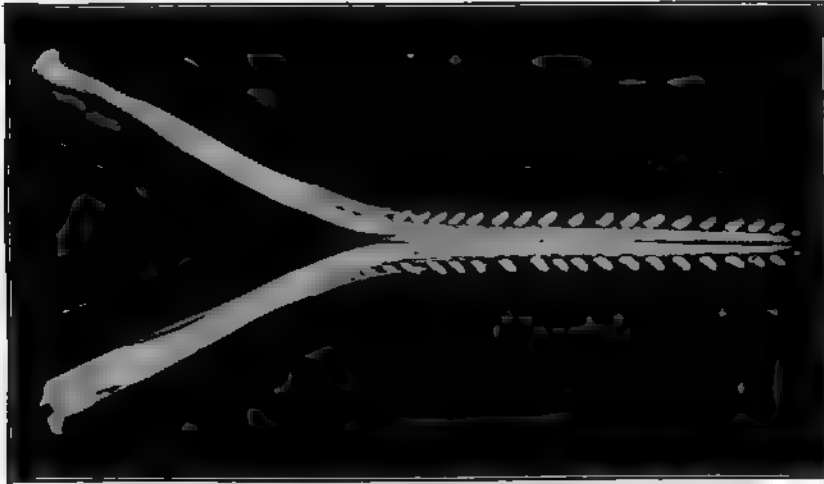


FIG. 4. PHYSETER MACROCEPHALUS—LOWER JAW.
No. 296 Field Columbian Museum Coll.

22. macrocephalus. (*Physeter*), Linn. Syst. Nat., 1766, p. 107.

Type locality. North Atlantic.

Geogr. Distr. All seas.

Genl. Char. Size enormous. Head about one-third the length of body, high, truncated, compressed in front; blow hole longitudinal, placed to the left of the median line on the upper end.

Color. Above black, shading gradually on the sides into the gray of the under parts. Occasionally specimens are piebald.

Measurements. Total length of adult 55 to 60 feet, female much smaller.

11. Hyperoödon.

Hyperoödon. Lacep. Hist. Nat. Cét., 1804, p. xlv. Type *H. butskopf* Bonn., = *H. rostratus* Müll.

Upper part of head anterior to blow hole rising abruptly from above the snout; upper ends of premaxillæ rise and expand laterally and overhang the nares; nasals concave along median line and anteriorly their outer edges expand over the front of inner border of the

maxillæ, particularly on the right side. At base of rostrum are high longitudinal crests on the maxillæ approximate in middle line and extending backward nearly to the nares. Cervical vertebræ coalesced. Vertebræ 45.

23. rostratus. (*Balæna*), Müll. Zool. Dan. Prodr., 1776, p. 7.

bidentatus, Bonn. Cétol., 1789, p. 25.

butskopf, Bonn. Cétol., 1789, p. 25.

anarnacus, Desm. Mamm., 1820, p. 550, No. 780.

hunteri, Desm. Mamm., 1820, p. 520, No. 782.

latifrons, Gray, Zool. Erebus and Terror, 1846, p. 27, pl. 4.

hyperoödon, Schleg. Zoogd. Nederl., 1870, p. 94, pl. 18.

Geogr. Distr. North Atlantic, Davis Straits, Hudson Straits.

Genl. Char. Contour of head, rounded, high above the beak, and descending abruptly to it anteriorly. In old males the anterior part of the head resembles a flat disc-like surface nearly covering or burying the beak and nearly at right angles to the line of the back. Other characters those of the genus.

Color. Old Adult. Yellowish, anterior part of head white, and a white band around the neck; beneath grayish white. Young, black; mature animals, light brown.

Measurements. Total length 30 feet, 20 in circumference.

12. Ziphius.

$$\frac{0-0}{1-1} = 2.$$

Ziphius. Cuv. Oss. Foss., 1823, 2d ed., v, p. 352. Type *Z. cavirostris*, Cuv.

Aliama. Gray, Proc. Zool. Soc., 1864, p. 242.

Petrorhynchus. Gray, Proc. Zool. Soc., 1865, p. 524.

Ziphiorhynchus. Burm. Ann. Mag. Nat. Hist., 1866, p. 94.

On either side of the mandible at anterior end is a single conical tooth, directed upwards and forwards. Rostrum triangular, tapering from base to apex; edges of maxillæ at base of rostrum raised into roughened tuberosities. "Premaxillæ immediately in front of and at the sides of the nares expanded, hollowed and with elevated lateral margins, the posterior ends rising to the vertex and curving forwards, the right being considerably more elevated than the left; the conjoint nasals forming a strongly pronounced symmetrical eminence at the top of the cranium, projecting forwards over the nares, flat above, most prominent and rounded in the middle line in front, and separated by a notch on each side from the premaxillæ. Anteorbital notch not distinct." (Flower.) Vertebræ, 49, the three anterior cervicals united.

24. *cavirostris*. (*Ziphius*), Cuv. Oss. Foss, 1823, v. 2nd. ed, p. 353.

Geogr. Distr. All seas.

Genl. Char. Those of the genus.

Color. Spec. from Nice. "Steel gray with numerous irregular white streaks, beneath white."

Measurements. Total length 16 feet.

Color. Specimen supposed to be of the same species taken at Warrington, New Zealand, vide Trans. Zool. Soc., 1889, p. 241. Upper parts, dorsal and flippers and upper part of flukes, purple black; sides of head before eye, and upper lip, dark brown shading below into the white of the throat. Lower jaw dark brown; throat anteriorly brownish. Under side of flukes white. Small white area from angles of mouth backward. Three oblique folds each side of the throat.

Measurements. Total length, 15 feet 11 in.; dorsal, 8 in.; widths at bases, 1.1; flipper on lower border, 1.7; width, 5 5.

13. *Mesoplodon*.

Mesoplodon. Gerv. Ann. Scien. Nat., 1850, 3rd. ser. xiv., p. 16. Type

D. sowerbiensis. Blainv.

Mandible with a compressed pointed tooth on either side at some distance from anterior extremity directed upwards, sometimes backwards and frequently of large size. Rostrum long, narrow; mesothmoid ossified in old animals, coalescing with adjacent bones. Region about nares like *Hyperoodon*, the nasals narrower and more sunken. Vertebrae, 46 to 48.

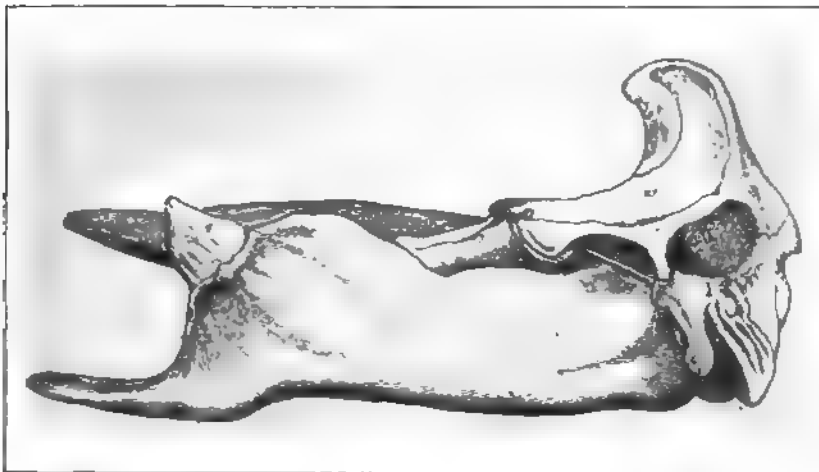


FIG. 5. *MESOPLODON DENSIROSTRIS*. SKULL
From Flower and Lydekker "Mammals living and extinct"

- 25. bidens.** (*Physeter*), Sowerby, Brit. Miscell., 1804, 1, p. 1.
sowerbyi and sowerbiensis, Blainv. Nouv. Dict., ix. 1817, p. 177.
epidon, Desm. Mamm., 1821, p. 521, No. 786.
dalei, Blainv. Bull. Soc. Philom., 1825, p. 139.
micropterus, Cuv. Règn. Anim., 1829, 1, p. 288.
Type locality. Coast of Elginshire, England.
Geogr. Distr. North Atlantic.

Genl. Char. Head higher than broad, forehead swollen; beak flat and rounded at tip. Eyes large; ear openings very small; pectoral small, ovate; dorsal elevated, falcate; tail triangular bi-lobed; vertebræ, 38.

Color. Brownish lead color, belly bluish ash.

Measurements. Total length of male, 16 feet, female 15 feet; length of her head, 2.7 in., pectoral, 1.6 in.; dorsal, 0.10 in., height of dorsal, .11 in.

Fam. III. **Delphinidae.**

F. W. True. *A Review of the family Delphinidæ*, Bull. U. S. Nat. Mus. 1889, No. 36, p. 1-191, pts. 1-47.

Scammon. *The Marine Mammals of Northwest North America*, 1874, p. 40.

Facial portion of skull produced into a beak; teeth numerous in both jaws; anterior ribs articulated to the transverse process by a tubercle; sternal ribs ossified. Lacrymal not distinct from the jugal; pterygoids short, thin, and form with a process of the palate the outer wall of the post palatine air-sinus.

Sub-Fam. I. **Delphinapterinae.**

14. Monodon.

$$\frac{1-1}{0-0} = 2.$$

Monodon. Linn. Syst. Nat., 1766, p. 105. Type *M. monoceras*, Linn.

Ceratodon. Briss. Règn. Anim., 1762, 1, p. 231.

Diodon. Storr. Prodr. Mamm., 1780, p. 42.

Narvalus. Lacep. Hist. Nat. Cét., 1804, p. 163.

Oryx. Oken. Lehrb. Naturg., 1815, p. 672.

Teeth produced in two twisted ivory tusks, generally concealed in the female, and in the male only a single tooth is greatly developed, usually the one on the left side, projecting horizontally, pointed and marked with spiral grooves. Head short, rounded; dorsal rudimentary; pectoral short, broad. Pterygoids not meeting, but approximating posteriorly. Vertebræ distinct, 50.

- 26. monoceras.** (*Monodon*), Linn. Syst. Nat., 1766, 1, p. 105.
vulgaris, Lacep. Hist. Nat. Cét., 1804, p. 142.
andersonii, Lacep. Hist. Nat. Cét., 1804, p. 163, pl. 9, fig. 1.
microcephalus, Flem. Mem. Wern. Nat.

Hist. Soc., 1811, t.

Type locality. Greenland Sea.

Geogr. Distr. Arctic seas.

Genl. Char. Same as those of the genus.

Color. Above dark gray, mottled with gray on sides and back; beneath white.

Measurements. Total length, 3915; tip of snout to pectoral, 762; length of pectoral, 381; greatest breadth of same, 17. Skull: total length, 54; length of rostrum, 23.7; breadth of same at base, 22; at middle, 13.7; interorbital breadth, 34.4; length of temporal fossæ, 15.2. Developed tooth often reaches a length of seven or eight feet.

15. Delphinapterus.

$$\frac{8-8}{8-8} \text{ to } \frac{10-10}{10-10} = 32 \text{ to } 40.$$

Delphinapterus. Lacep. Hist. Nat. Cét., 1804, p. xli. Type *D. beluga*, Lacep.

No dorsal fin, middle of back arched; head globose; pectorals, short, broad, pointed; teeth standing apart, small, conical and pointed, crowns inclined forwards. Skull elongated, depressed, narrow; rostrum broad at base, narrowing toward tip where it is recurved. Vertebrae, 50.

- 27. leucas.** (*Delphinus*), Pall. Reise, Runl., 1776, 111, p. 85, pl. 74.

catodon, (Linn.) Syst. Nat., 1766, p. 10.

beluga, Lacep. Hist. Cét., 1804, p. 50.

albicans, (Klein). Briss. R. Anim., 17, p. 259.

canadensis, Desm. Mamm., 2nd Pt., 1822, p. 516.

angustata, Cope, Proc. Acad. Nat. Scien. Phila., 1859, p. 25.

rhinodon, Cope, Proc. Acad. Nat. Scien. Phil., 1865, p. 278.

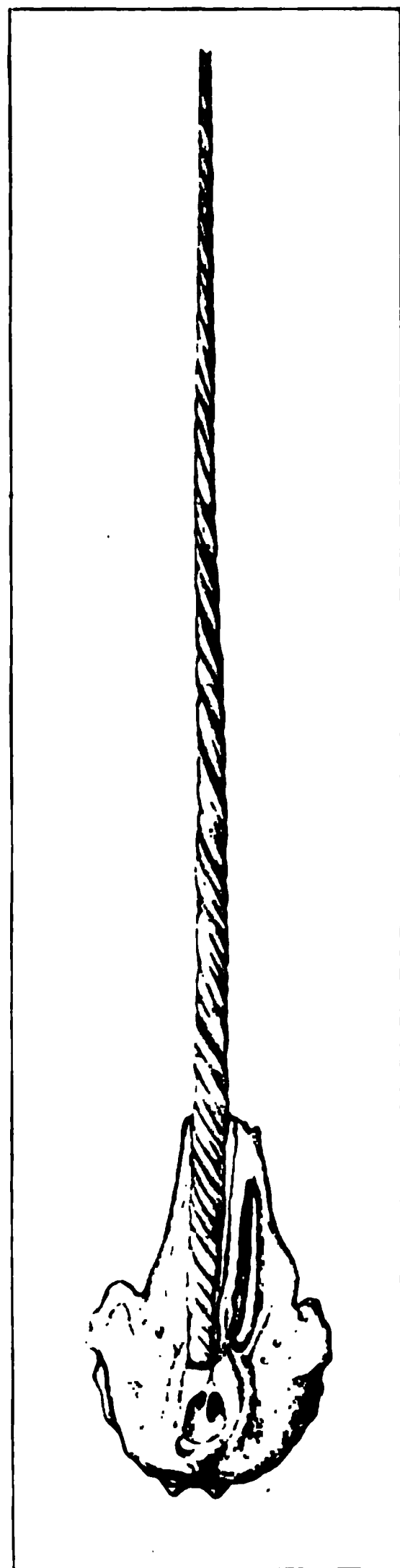


FIG. 6. MONODON MONOCERAS.

From Flower and Leydekker "Mammals living and extinct."

concreta, Cope, Proc. Acad. Nat. Scien. Phil., 1865, p. 278.

declivis, Cope, Proc. Acad. Nat. Scien. Phil., 1865, p. 278.

Type locality. Coast of Siberia.

Geogr. Distr. Arctic and sub-Arctic seas. South to Cape Cod, Mass.

Genl. Char. Pterygoids approximating towards their ends, but not meeting; intermaxillæ broad somewhat convex, sometimes extending to posterior wall of the superior nares. Other characters same as those of the genus.

Color. All white.

Measurements. Total length 3483; tip of snout to pectoral, 736; length of pectoral, 410; breadth of same, 255. Skull: total length, 53.3; length of rostrum, 26.4; breadth at base, 18.3; at middle, 9.9; interorbital breadth, 27.2; length of temporal fossæ, 15.2.

16. Phocaena.

$$\frac{25-25}{25-25} = 100.$$

Phocæna. Cuv. Règn. Anim., 1817, 1, p. 279. Type *D. phocæna*, Linn.

Rostrum short, broad, tapering towards apex, premaxillæ raised into tubercles before the nares; nasals flat; mandibular symphysis short; teeth small, crowns spade-shape, occupying nearly the entire length of rostrum; the neck of each tooth constricted; pterygoids separated on median line; head not beaked; dorsal fin small, blunt spines often seen on the anterior margin; pectoral fins ovate; first to sixth cervical vertebræ coalesced.

28. communis. (*Phocæna*), Cuv. Règn. Anim., 1817, p. 279.

phocæna, (*Delphinus*), Linn. Syst. Nat., 1758, p. 77.

vomerina, Gill. Proc. Acad. Nat. Scien. Phil., 1865, p. 178.

brachycium, Cope, Proc. Acad. Nat. Scienc. Phil., 1865, p. 279.

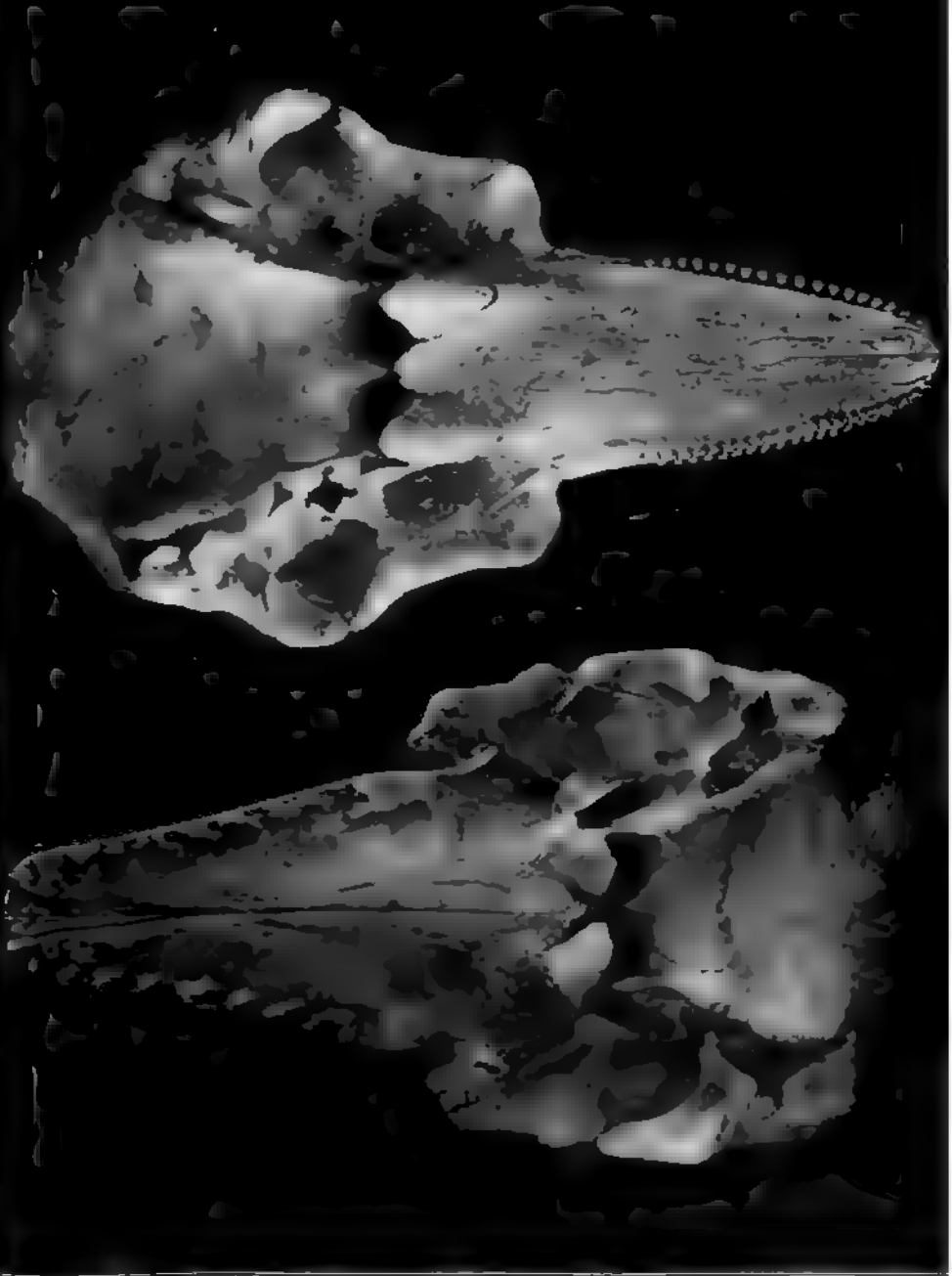
? lineata, Cope, Proc. Acad. Nat. Scienc. Phil., 1876, pp. 134, 135.

Type locality. Coast of Europe.

Geogr. Distr. North Atlantic to North Pacific Oceans. United States coasts, Maine to New Jersey, and Puget Sound to Glacier Bay, Alaska.

Genl. Char. Slender; dorsal fin anterior to middle of the length, triangular, posterior margin concave, anterior about straight, with sometimes a row of tubercles. Jaws of equal length.

Color. Upper parts slate or blackish, grading on sides into the white of lower parts. Sides somewhat tinged with yellow or pink. Narrow dark line from corner of mouth to anterior base of pectoral, and a broad dark band often extends from lower jaw half way to the pectoral.



PHOCAENA COMMUNIS.

No. 43 Field Columbian Museum Coll. Little less than $\frac{1}{2}$ nat. size.

DELPHINAPTERUS LEUCAS.

No. 46 Field Columbian Museum Coll. Little more than $\frac{1}{2}$ nat. size.

Measurements. Total length, 1727; length of mouth, 121; end of snout to dorsal, 737; length of pectoral, 178; height of dorsal, 102; width of flukes, 31.7. Skull: total length, 293; length of rostrum, 137; width of beak at base, 85; at middle, 55; interorbital breadth, 137; length of temporal fossa, 6.

29. dalli. (*Phocaena*), True, Proc. U. S. Nat. Mus. Wash., 1885, p 95, pls. 2-6.

Type locality. Strait west of Adakh Island, Aleutian group.

Geogr. Distr. North Pacific Ocean, Alaska; Aleutian Islands.

Genl. Char. Lower jaw longer than upper. Head sloping, dorsal fin moderate, falcate, placed anterior to middle of total length, anterior margin with small tubercles. Dorsal and ventral margins of body with prominent ridges, teeth small; vertebrae, 97.

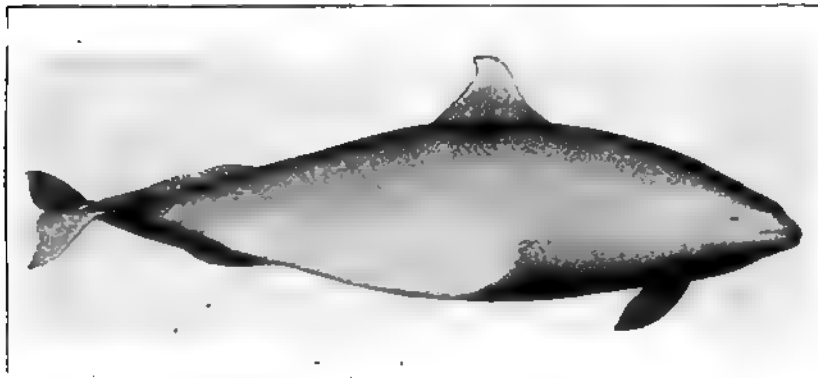


FIG. 7. PHOCAENA DALLI.

From True, Rev. Delphinidae. Drawing by W. H. Dall

Color. Black: belly and lower half of sides from anterior margin of dorsal to behind vent, white streaked with fine dark lines. Dorsal tipped with white.

Measurements Total length, 1829; tip of snout to dorsal, 698; length of mouth, 88; of pectoral, 203; height of dorsal, 152. breadth of flukes, 47. Skull total length, 333; length of beak, 140; breadth at base, 95; at middle, 57; interorbital breadth, 165; length of tooth line, 127; depth of temporal fossa, 25.

17. Orcinus.

$$\frac{12-12}{12-12} = 48.$$

Orcinus Fitzin. Wiss-Populaire Naturgesch, Säugeth , 1860, vi., pp. 204, 217. Type *O. gladiator*, Bonnat.

Orca. Gray Zool. Erebus and Terror, 1846, p. 33 (nec Wagl, 1830).

Teeth very large, stout, occupying nearly the entire length of the rostrum which is broad and elongated, flattened above and rounded anteriorly. Pterygoids separate, premaxillæ concave before the nares, narrow in the middle and widening towards end. Head depressed; no beak; dorsal large, prominent, pointed; pectoral fins large, ovate. First and second vertebræ, sometimes the third, coalesced. Vertebræ, 52.

30. gladiator. (*Delphinus*), Bonnat. Cét., 1789, p. 23.

arcticus and europæus, Gerv. & Van Ben. Ost. Cét., 1804, p. 314.

schlegelii, Lilljeb. Roy. Soc., 1866, p. 235.

latirostris, Gerv. Ost. Cét., 1868, p. 543.

stenorhyncha, Gray, Proc. Zool. Soc., 1870, p. 74.

Type locality. Coast of Europe.

Geogr. Distr. All seas.

Genl. Char. Size large, characters those of the genus.

Color. Upper portion of head and body, and all of the fins black; under jaw, throat, breast and belly white; a white trident-shaped area extends back to the vent with one tine, the two others passing obliquely upwards and backward on the sides. A large white patch behind the eyes. Behind dorsal fin is a crescentic purple area.

Measurements. Total length about 16 feet.

31. rectipinna. (*Orca*), Cope, Proc. Acad. Nat. Scien. Phil., 1869, p. 22, figs. 15 and 16.

atra, Cope, Proc. Acad. Nat. Scien. Phil., 1869, pp. 22, 58, fig. 17.

Type locality. Pacific coast of United States.

Geogr. Distr. Pacific Ocean. California to the Aleutian Islands.

Genl. Char. Muzzle slightly acuminate, dorsal fin long, "six feet or more in larger males" placed one-third the length from muzzle.

Color. Black; white beneath with white lines on the sides from eyes to hinder margin of dorsal fin.

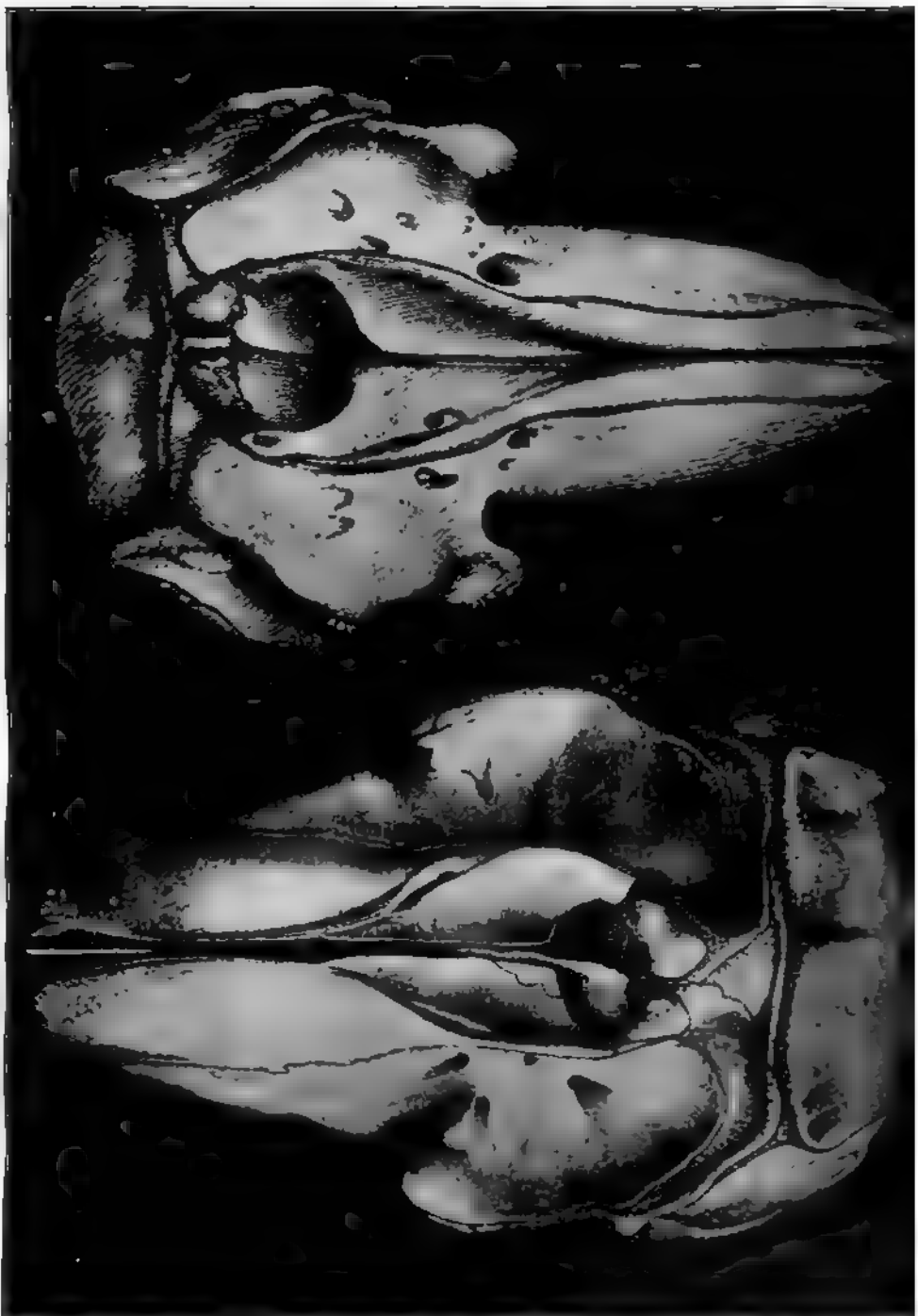
Measurements. Total length about 20 feet; height of dorsal fin, 6 feet.

18. Pseudorca.

$$\frac{10-10}{10-10} = 40.$$

Pseudorca, Reinh. Overs. Dan. Sezsk. Forh., 1862, p. 151. Type *P. crassidens*, Owen.

Rostrum short, broad, rostral portion of intermaxillæ truncated at distal end; pterygoids short, approximated on median line; teeth large, roots cylindrical. Vertebræ, 50; the first to sixth or seventh coa-



OEDON & GAUDAUR (LACÉPÈDE)
 Ex. True (From Lillieson, Kgl. Danske Videnskabs Selskabs Skriftet,
 6te Række, iv, 1867, p. 372, fig. y).

PSEUDOCERA CRASSIPENNIS (OWEN)
 Ex. True (From Van Beneden and Gervais, Ostéographie des Cétoctes,
 1868-'79, pl. 50, fig. 7).

lesced. Pectoral fins moderate, pointed; dorsal near middle of back, moderate falcate. Head elevated before blow hole, compressed; snout truncated.

32. crassidens. (*Phocæna*), Owen, Brit. Foss. Mamm. 1846, p. 516.

meridionalis, Flower, Proc. Zool. Soc., 1864, p. 420.

destructor, Cope, Proc. Acad. Nat. Scienc. Phil., 1866, p. 293.

grayi, Burm. Ann. Mus. Pub. Buen. Aires., 1864-69, 1, p. 367, pl. xxi.

Type locality. Lincolnshire, England.

Geogr. Distr. All seas.

Genl. Char. Size large. No beak; head sloping gradually from blow hole to end of snout. Dorsal in center of length narrow, moderate; pectoral small.

Color. All black.

Measurements. Skull: total length, 595; length of rostrum, 287; breadth at base, 208; at middle, 188; interorbital breadth, 333; length of temporal fossa, 191.

19. Globiocephalus.

$$\frac{8-8}{8-8} \text{ to } \frac{12-12}{12-12} = 32 \text{ to } 48.$$

Globiocephalus. Less. Nouv. Tabl. Règn. Anim., Mamm., 1842, p.

200. Type *Delphinus deductor*. Scoresby. = *D. melas*. Traill.

Teeth, only on anterior half of rostrum and mandible, small conical, acute, curved. Rostrum short, broad; mandibular symphysis short; pterygoids in contact; skull broad, depressed; premaxillæ concave in front of nares; as wide at middle as at base. Vertebrae, 57-60. First five or six cervical vertebrae coalesced. Fore part of head round; dorsal low, triangular.

33. melas. (*Delphinus*), Traill. Nichols, Jour. 1809, xxiii, pl. 3.

globiceps, Cuv. Ann. Mus., 1812, p. 14, pl. 1, figs. 1 and 2.

deductor, Scoresby, Arct. Règ., 1820, 1, t. 13, fig. 1.

intermedius, Harl. Jour. Acad. Nat. Scien. Phil., 1829, p. 51, pl. 1, fig. 13.

incrassatus, Gray, Proc. Zool. Soc., 1861, p. 309, fig. 1.

macrorhynchus, Hector, (nec Gray), Trans. N. Zeal. Inst., vii, 1861, pl. 16, figs. 3, 3a.

Type locality. Coast of England.

Geogr. Distr. North and South Atlantic Oceans, coast of Massachusetts and New York, eastern end of Long Island.

Genl. Char. Teeth $\frac{8}{8}$ to $\frac{12}{12}$; vertebrae, 59-60. Maxillaries and intermaxillaries rugose anteriorly; second and third vertebrae coalesced.

Color. Black; a white area beneath.

Measurements. Total length about 20 feet.

34. brachypterus. (*Globiocephalus*). Cope, Proc. Acad. Nat. Scien. Phil., 1876, p. 129, fig. p. 131.

Type locality. East coast of Delaware Bay, at the mouth of Maurice River.

Geogr. Distr. Atlantic coast of North America, New Jersey to the Gulf of Mexico and West Indies.

Genl. Char. Pectoral fins one-sixth the total length of body; dorsal placed forward of middle length; teeth, 8; vertebræ 57. Skull massive. Rostrum broad, the basal width greater than four-fifths total length; temporal fossæ large, oval; intermaxillæ large and flat.

Color. Entirely black.

Measurements. Total length, 4648; tip of snout to dorsal, 1206; length of pectoral, 762; height of dorsal, 356; width of flukes, 1168. Skull: total length, 662; length of rostrum, 333; breadth at base, 288; at middle, 235; interorbital breadth, 45; length of temporal fossa, 163.

35. scammoni. (*Globiocephalus*), Cope, Proc. Acad. Nat. Scien. Phil., 1869, p. 21.

Type locality. Coast of Lower California.

Geogr. Distr. Coasts of North and South America from California southward; occasionally going into high northern latitudes.

Genl. Char. Similar to *G. brachypterus*; pectoral fins longer. Skull heavy; intermaxillæ not projecting over the lateral margins of rostral portion of maxillæ. Superior nares broad and bordered by narrow plates of the intermaxillæ; pterygoids short, approximate.

Color. Entirely black.

Measurements. Total length, 4724; tip of snout to dorsal, 1372; length of pectoral, 864; width of flukes, 1007. Skull: total length, 690; length of rostrum, 340; breadth at base, 308; at middle, 252; interorbital breadth, 487; length of temporal fossa, 148.

20. Grampus.

$$\frac{0-0}{3-3} \text{ to } \frac{0-0}{14-14} = 6 \text{ to } 28.$$

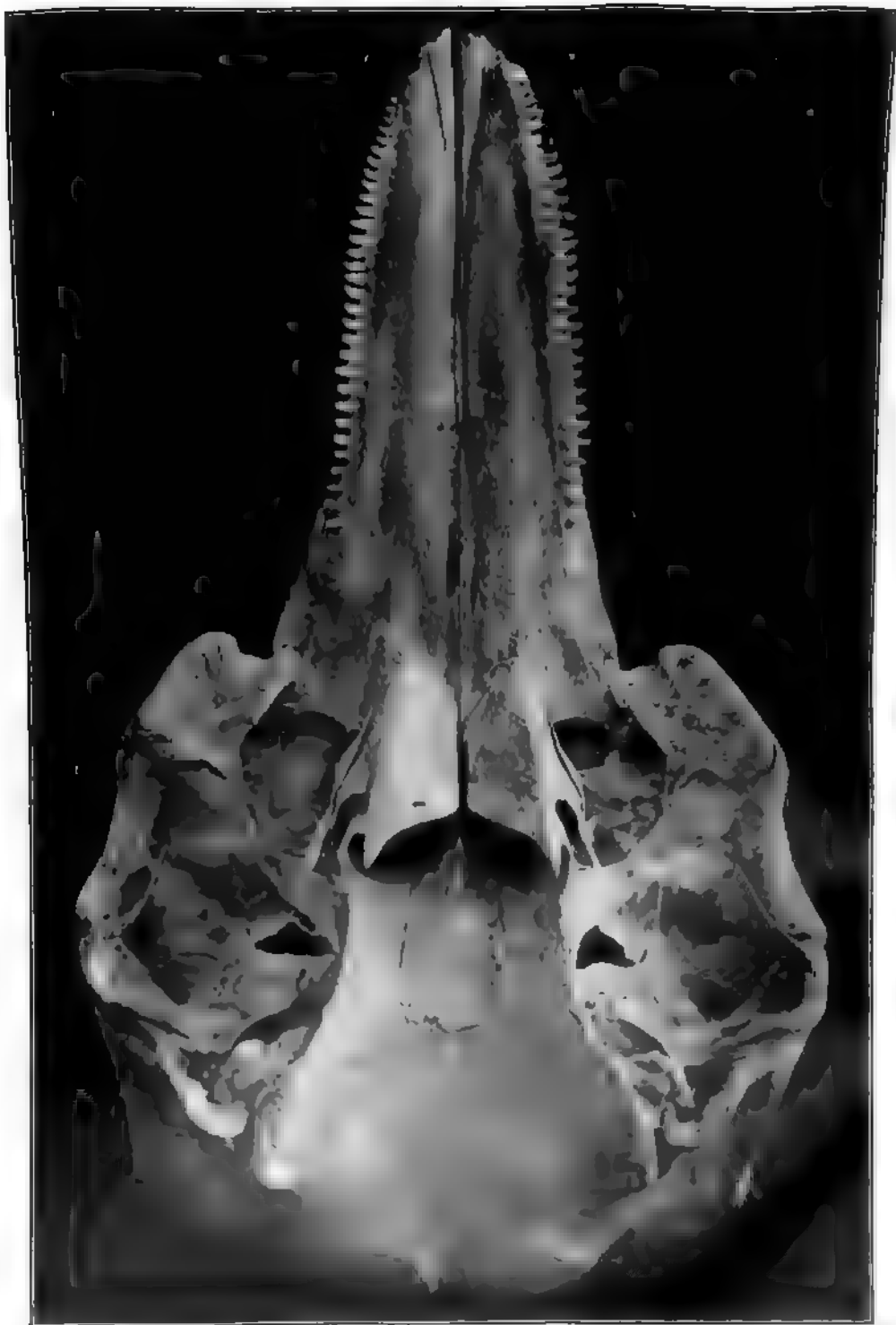
Grampus. Gray, Zool. of Erebus and Terror, 1846, p. 30. Type *D. griseus*, Cuv.

Rostrum moderate, expanding in front of maxillary notches, and tapering to tip; rostral portion of intermaxillary broad and rounded. No teeth in upper jaw. Pterygoids in contact, no beak; dorsal fin rather large, falcate; pectorals long, narrow, falcate; vertebræ, 68.



GRAMPUS GRISEUS (Cuvier).

GLOBICEPHALUS MELAS (Trail).



LAGENORHYNCHUS ACUTUS.

No. 45 Field Columbian Museum Coll. About $\frac{1}{2}$ nat. size.

- 36. griseus.** (*Delphinus*), Cuv. Ann. Mus., 1812, p. 14, pl. 1, fig. 1.
rissoanus, Desm. Mamm., 1822, p. 519.
intermedius, Harl. Journ. Acad. Nat. Scien. Phil., 1829, p. 51.
cuvieri. Gray. Ann. Mag. Nat. Hist., 1846, p. 85.
stearnsii. Dall. Proc. Calif. Acad. Scien., 1873, v, p. 13.

Type locality. Brest, coast of France.

Geogr. Distr. North Atlantic to North Pacific Oceans. Coasts of United States, Cape Cod to Atlantic City, New Jersey; California.

Genl. Char. Head globose; beak indicated; lower jaw the shorter; mouth oblique; dorsal fin high, falcate; pectorals falcate, long. Flukes narrow. Vertebrae, 68. Prenareal area elevated.

Color. Head and anterior half of body light gray tinged with yellow; belly grayish white; body marked conspicuously with fine light-colored irregular lines. Back, dorsal fin and flukes, dark gray or blackish tinged with purple.

Measurements. Total length, 2305; tip of snout to dorsal, 1270; length of pectoral, 604; height of dorsal, 407; breadth of flukes, 736. Skull: total length, 530; length of rostrum, 260; breadth at base, 205; at middle, 128; interorbital width, 342; length of temporal fossa, 133.

21. Lagenorhynchus.

$$\frac{22-22}{22-22} \text{ to } \frac{45-45}{45-45} = 88 \text{ to } 90.$$

Lagenorhynchus. Gray, Zool. Erebus and Terror, 846, p. 34. Type *Delphinus leucopleurus*, Rasch. *D. acutus*, Gray.

Rostrum broad; rostral portion of intermaxillæ flat, sometimes convex; pterygoids in contact or separate; teeth variable in size. Vertebrae, 73 to 92. Beak short; dorsal and pectorals moderate, falcate; caudal ridges prominent.

- 37. acutus.** (*Delphinus*), Gray, Spicil. Zool., 1828, p. 2.
eschrichtii, Schleg. Abh. Geb. Zool., 1841, p. 23.
leucopleurus, Rasch. Nyt. Mag. for Naturv., 1843, lv. p. 97, pls. 2, 3.
arcticus, Gray, Syn. Cet., 1868, p. 7.
perspicillatus. Cope, Proc. Acad. Nat. Scien. Phil., 1876, p. 136, pl. 4.
gubernator. Cope, Proc. Acad. Nat. Scien. Phil., 1876, p. 136, pl. 4.

Type locality. Faroe Islands, North Sea.

Geogr. Distr. North Atlantic Ocean; northern coast of United States; Cape Cod, Greenland, Faroe Island, North Sea.

Genl Char. Stout, forehead sloping; beak a mere rim; dorsal high, recurved, attenuated distally; pectorals broad at base, pointed; flukes large; caudal ridges greatly developed.

Color. Sides of head and body gray; upper jaw, forehead, back of fins, black; sides of tail above, dusky yellowish; below dorsal fin on sides, a white oblong area. From base of flukes to the dorsal fin, a narrow black line, and another from base of pectorals to corner of the mouth; orbital ring black, from which a line goes to the beak; vent black; base of flukes beneath and margin of tail whitish. Margin of lower jaw occasionally black.

Measurements. Total length, 2515; ends of snout to pectoral, 406; to dorsal, 939; length of pectoral, 330; breadth of flukes, 635. Skull: total length, 425; of rostrum, 216. breadth at base, 114; at middle, 76; interorbital breadth, 216; length of temporal fossa, 84; depth, 43.

38. thicola. (*Lagenorhynchus*), Gray, Proc. Zool. Soc., 1849, p. 2.

Type locality. West coast of North America.

Geogr. Distr. West coast of North America.

Genl. Char. "Rostrum long, narrow, greatest breadth one-fourth the length; intermaxilla flat, narrow; temporal fossa small, rounded; margins of proximal half of rostrum thickened: the superior surface of the maxilla in this part at a different angle from the plane of the distal half of the rostral part of the maxilla, which looks downward and forward." Only the skull known.

Measurements. Skull: total length, 375; length of beak, 210; breadth at base, 97; at middle, 53; breadth of intermaxilla at same point, 28; interorbital breadth, 163; length of temporal fossa, 56.

39. albirostris. (*Delphinus*), Gray, Ann. Mag. Nat. Hist., 1846, p. 84.
ibsenii, Eschricht. Undersøgelser over Hvaldyrene 5te Afh., p. 73.

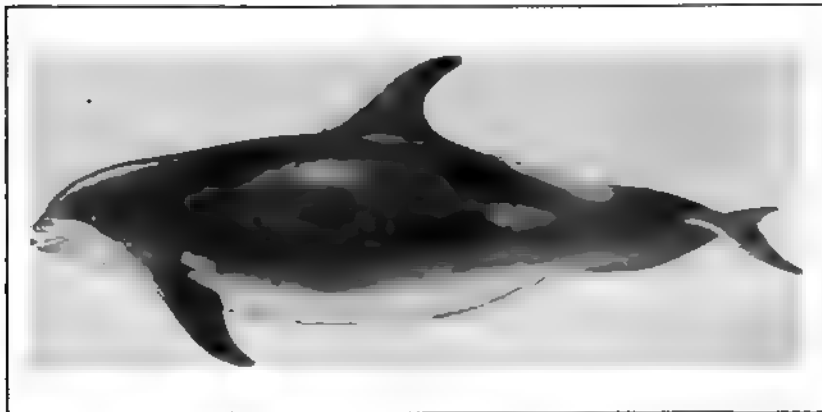


FIG. 8. LAGENORHYNCHUS ALBIROSTRIS.

From True, rex-Lüttken, Kgl. Danske Videnskabs Selskabs Skrifter 6th Række IV, 1887, pl. 21.

Type locality. Coast of Norfolk, England.

Geogr. Distr. North Atlantic Ocean, Greenland, North and Baltic Seas, Faroe Islands, Davis Straits.

Genl. Char. Similar in form to *L. acutus*, forehead more swollen; dorsal more attenuated and reclined; pectorals larger. Teeth, $\frac{26}{8}=\frac{24}{8}$; vertebræ, 88-92.

Color. Forehead, except base, back and fins, black; sides grayish black; beneath, white. Base of forehead, beak and mandibles, white tinged with gray. On sides, three irregular areas, one above base of pectoral, one below insertion of anterior margin of dorsal, and one below the insertion of the posterior margin of dorsal, white mottled with black, gray and brown. Behind the blow hole on back and near the insertion of the flukes on the tail are similar light areas. Flukes beneath, grayish.

Measurements. Total length, 1664; end of snout to base of dorsal, 762; height of dorsal, 152; length of pectoral, 305; breadth of flukes, 381. Skull: total length, 460; length of rostrum, 229; breadth at base, 152; at middle, 87; interorbital width, 235; length of temporal fossa, 79.

40. obliquidens. (*Lagenorhynchus*), Gill, Proc. Acad. Nat. Scien. Phil., 1865, p. 177.

longidens, Cope, Proc. Acad. Nat. Scien. Phila., 1866, p. 295.

similis, Gray, Proc. Zool. Soc., 1868, p. 147.

Type locality. Coast of California.

Geogr. Distr. North Pacific Ocean, Monterey to Puget Sound, coast of United States.

Genl. Char. Rather stout; dorsal falcate; skull similar to that of *L. acutus*, but narrower, premaxillæ rounded, outer margins not sinuate; pterygoid not meeting on median line, divergent posteriorly; vomer visible in median line of palate. Teeth, $\frac{31}{3}=\frac{31}{3}$; vertebræ, 74.

Color. Above, black, or greenish black; broad strips of white, gray and black on the sides; beneath, white. Posterior edge of dorsal and flukes tipped with grayish white.

Measurements. Total length, 2210; breadth of flukes, 610; end of snout to anterior base of dorsal, 914. Skull: total length, 413; length of rostrum, 209; breadth at base, 118; at middle, 81; interorbital breadth, 192; length of temporal fossa, 84; depth of same, 68.

22. Delphinus.

$$\frac{40-40}{40-40} \text{ to } \frac{60-60}{60-60} = 160 \text{ to } 240.$$

Delphinus, Linn. Syst. Nat., 1758, p. 77. Type *D. delphis*, Linn.

Eudelphinus, Gerv. Ostéog. des Cétaces, 1880, p. 600.

Teeth occupying nearly all the rostrum, numerous in both jaws, conical, acute, curving; rostrum twice the length of brain case; pterygoids meeting on median line for their entire length; palate grooved deeply laterally; pectoral fin moderate, falcate.

41. delphis. (*Delphinus*), Linn. Syst. Nat., 1758, p. 77.

fulvo-fasciatus, Wagn. Schreb. Säugth., pl. 361, fig. 1.

novæ-zelandiæ, Quoy & Gaim. Voy. Astrol., Mam., 1830, p. 149.

janira, Gray, Zool. Erebus and Terror, 1846, p. 41, pl. 23.

albrinanus, Peale, U. S. Expl. Exped., Mam., 1848, v, iii, p. 33.

algeriensis, Loche. Rev. Mag. Zool., 1860, p. 474, pl. 22, fig. 1.

forsteri, Gray, Cat. Cet., 1866, p. 248.

major, *moorei* & *walkeri*, Gray, Cat. Cet., 1866, pp. 396, 397.

pomecgra, Owen, Trans. Zool. Soc., 1866, vi, p. 23, pls. 6, 8.

bairdii, Dall. Proc. Calif. Acad. Nat. Scien., 1873, v, p. 12.

microps, Burm. (nec Gray), Desc. Phys. Argent., 1879, iii, p. 534.

fuscus, *sowerbianus*, *variegatus*, *batteatus*, *moschatus* (La Font).

Fisch. Act. Soc. Linn. Bord., 1881, v, p. 127, pls. 4, 5, 6.

marginatus, La Font. (nec Pucher). Act. Soc. Linn. Bord., vi, p. 518.

curvirostris, Riggio, Nat. Sicil., 1883, ii, p. 157, pl. 3.

Type locality. Coast of Europe.

Geogr. Distr. Atlantic Ocean, Mediterranean Sea, etc.

Genl. Char. Body slender, forehead forming an angle to the beak, which is long and slender; dorsal fin in the center of dorsal line, narrow; pectorals three times longer than broad, pointed.

Color. Very variable. Upper parts black and blackish gray, beneath white or greenish white; black, gray or greenish band from lower jaw to base of pectoral fin; orbital ring black, from which a black band extends forward to the base of the beak. Margin of lower jaw black. Elongated areas of light festoons of gray on sides traversed by two longitudinal bands of gray or greenish gray.

Measurements. Total length, 1382,–2008; length of pectoral, 280,–305; width of flukes, 393,–450; height of dorsal, 177,–203; blow hole to end of nose, 330,–356.

23. Tursiops.

$$\frac{21-21}{21-21} \text{ to } \frac{25-25}{25-25} = 84 \text{ to } 100.$$

Tursiops. Gerv. Hist. Nat. Mamm., 1855, ii, p. 323. Type *D. tursio*, Fabric.

Tursio, Gray, (nec Wagl). Cat. Seals and Whales, 1866, p. 254.

Rostrum with moderate taper; no groove in palate; mandibular symphysis short, teeth stout; vertebræ, C. 7, D. 13, L. 17, C. 27 = 64. Dorsal fin high, falcate.



DELPHINUS DELPHIS

No. 44 Field Columbian Museum Coll. Little more than $\frac{1}{2}$ nat. size.

TURSIOPS TURSIOS (FABRICIUS)

Es. True (From Van Beneden and Gervais, Osteographie des Cétacés, 1867-70, pl. 34, fig. 30.)

42. tursio. (*Delphinus*), Fabric. Faun. Groenl., 1780, p. 49.

truncatus, Montagn, Mem. Wern. Soc., 1821, 111, p. 73.

compressicauda, Less. Cét., 1828, p. 199.

communis, Fitzin. (nec Cuv). Carr. Dalm., 1846, p. 75.

metis, Gray, Zool. Erebus and Terror, 1846, p. 38, pl. 17.

cymodice, Gray, Zool. Erebus and Terror, 1846, p. 38, pl. 17.

eurynome, Gray, Zool. Erebus and Terror, 1846, pl. 38, pl. 18.

Type locality. Coast of Greenland.

Geogr. Distr. Atlantic Ocean, Mediterranean Seas—widely distributed. Atlantic coast of Atlantic states, Maine to Florida; Gulf of Mexico.

Genl. Char. Practically those of the genus. Frontal bone has no backward extension and the parietal is broad inferiorly.

Color. Upper parts of fins plumbeous gray tinged with purple, grading on sides into the pure white of the underparts.

Measurements. Total length skull, 432; length of beak, 232; greatest breadth of beak, 108; length of tooth line, 195; width between interorbitals, 191; length of mandible, 365. Total length of animal, 2907; of mouth, 319; height of dorsal fin, 229; breadth of flukes, 612.

43. gillii. (*Tursiops*), Dall, Proc. Calif. Acad. Scien., 1873, v, p. 13.

Geogr. Distr. North Pacific Ocean and along shores of Southern and Lower California.

Genl. Char. Optic canal not reaching the level of the rounded antero-internal border of the deeply concave frontal, and the lower part of the parietal is a narrow band between the anterior margin of the squamosal, and the posterior margin of a backward extension of the frontal.

Color. "Black all over, lightened a little below."

Measurements. Length of beak, 298; breadth at base of maxillary vertebræ, 141; at the middle, 88; length of tooth line, 254; length of mandible, 427.

24. Lissodelphis.

$$\frac{44-44}{44-44} \text{ to } \frac{44-44}{47-47} = 176 \text{ to } 182.$$

Lissodelphis. Glog. Hand-u Hilfsbuch d. Naturgesch., 1841, p. 169.

Type D. peronii Lacepède.

Tursio, Wagl. Nouv. Syst. Amph. 1830, p. 34 (nec Fleming).

Delphinapterus, Gray, Zool. Erebus and Terror, 1846, p. 35.

Dorsal fin absent. Rostrum long, tapering, flat; pterygoids separate; margins parallel; mandibular symphysis short; teeth small, acute. Beak short, narrow; pectoral fins falcate.

- 44. borealis** (*Delphinapterus*), Peale U. S. Expl. Exp., Mamm., 1848, p. 35, pl. viii, fig. 2.

Geogr. Distr. North Pacific Ocean, San Diego, coast of California to Bering Sea.

Genl. Char. Slender; lower jaw longer than upper, decurved at extremity; flukes small, symphysis of mandible not keeled.

Geogr. Distr. North Pacific Ocean, coast of California, Japan.

Color. Lozenge-shaped area on a line between the pectorals and flukes, end of lower jaw and lower sides of flukes white or clouded with white, remaining parts black.

Measurements. Total length, 2464; end of snout to pectoral, 635; length of pectoral, 305; breadth of flukes, 406. Skull: total length, 437; length of rostrum, 240; breadth of rostrum at base, 110; at middle, 56; interorbital breadth, 176; length of temporal fossa, 71.

25. Prodelphinus.

$$\frac{30-30}{30-30} \text{ to } \frac{50-50}{50-50} = 120 \text{ to } 200.$$

Prodelphinus. Gerv., Ostéog., des Cétacés, 1880, p. 604. Type *P. dubius*, Cuv.

Clymene, Gray, Proc. Zool. Soc., 1864, p. 237 (nec Oken et Savi, 1815-17).

Clymenia, Gray, Syn. Whales and Dolphins, 1868, p. 6 (nec Münst., 1839).

Teeth smaller than those of *Tursiops*. Rostrum long, narrow; no groove in palate. Vertebrae, 73-78. Symphysis of mandible, short. Beak elongated. Dorsal and pectoral fins falcate.

- 45. euphrosine.** (*Delphinus*), Gray, Zool. Erebus and Terror, 1846, p. 40, pl. 22.

styx, Gray, Zool. Erebus and Terror, 1846, p. 39, pl. 2.

tethys, Gerv. Bull. Soc. Agr. Herault, 1853, xl, p. 150, pl. 1.

marginatus, (Duvern). Pucher. Rev. Zool., 1854, p. 547.

doreides, Gray, Cat. Cet., 1866, p. 400.

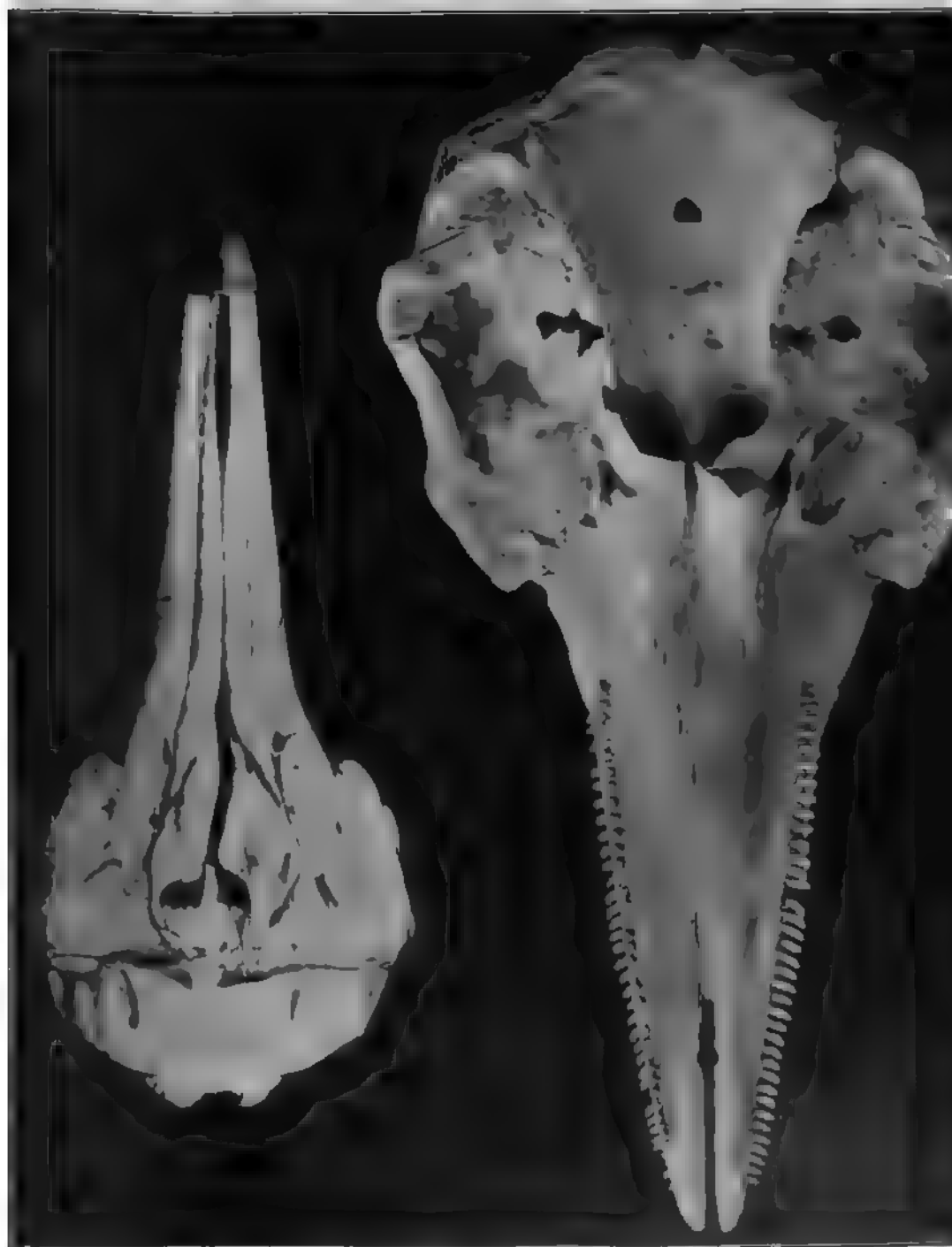
euphrosinoides, Gray, Synops. Whales and Dolphins, 1868, p. 6.

novæ-zelandiæ, Hector, (nec Gray), Trans. N. Z. Inst., v, p. 159.

Geogr. Distr. Atlantic Ocean, South Greenland, Mediterranean Sea.

Genl. Char. Body stout, beak long; dorsal fin high, falcate; pectorals small.

Color. Above black; sides blackish, beneath white; orbital ring black; black band from eye to vent and one going downward and backward above base of the pectorals; this black band is divided from the dark color above by a white band which is broadest in the middle.



PRODELPHINUS EUPHROSYNÆ (GRAY).

Ex. Tr. From Gray: *Synopsis of Whales and Dolphins* (1865, p. 22.)

LISSODELPHUS BOREALIS

No. 23 Field Columbian Museum (coll.).

Broad black band from eye to base of pectoral with white area in its center that joins the white throat below the eye. Fins black, margined anteriorly with white.

Measurements. Total length, 2097; end of beak to base of dorsal, 932; breadth of flukes, 420; anterior margin of pectoral fin, 305.

46. crotaphiscus. (*Delphinus*), Cope, Proc. Nat. Scien. Phil., 1865, p. 203.

Type locality. Unknown. Type, skull in the museum at Salem, Mass.

Geogr. Distr. Unknown.

Genl. Char. Muzzle flat, carina in front of blow holes; small temporal fossa, only a trace of the groove in roof of mouth. Paroccipital alæ moderately developed; inner margin of glenoid cavity produced into a lamina; palatines terminating next the orbits, sphinoids in a free keel and with a strong lateral keel.

47. plagiodon. (*Delphinus*), Cope, Proc. Acad. Nat. Scien. Phil., 1866, p. 296.

Type locality. Eastern coast of United States.

Geogr. Distr. Atlantic coast of the United States, Cape Hatteras to Gulf of Mexico.

Genl. Char. Dorsal fin high, recurved; pectoral fins broad at base; beak stout.

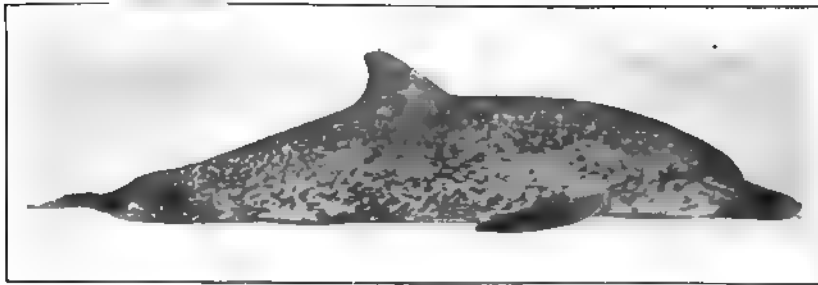


FIG. 9. PRODELPHINUS PLAGIODON.

Ex-True, Rev. Delphinidae, from photo. of specimen taken on U. S. steamer Albatross.

Color. Above purplish gray, shading on the sides into the white of the underparts. Upper parts and fins spotted with white or gray; lower parts spotted with dark gray.

Measurements. Total length, 2157; length of mouth, 280; of pectoral fin, 304; end of beak to dorsal, 337; height of dorsal, 241; breadth of flukes, 527.

48. fraenatus. (*Delphinus*), Cuv. Mamm., 1825, pl. 426.

frontalis, (Duss). Cuv. Règn. Anim., 1829, 1, p. 288.

doris, Gray, Zool. Erebus and Terror, 1846, p. 39, pl. 20.

clymene, Gray, Cat. Cet., 1866, p. 249.

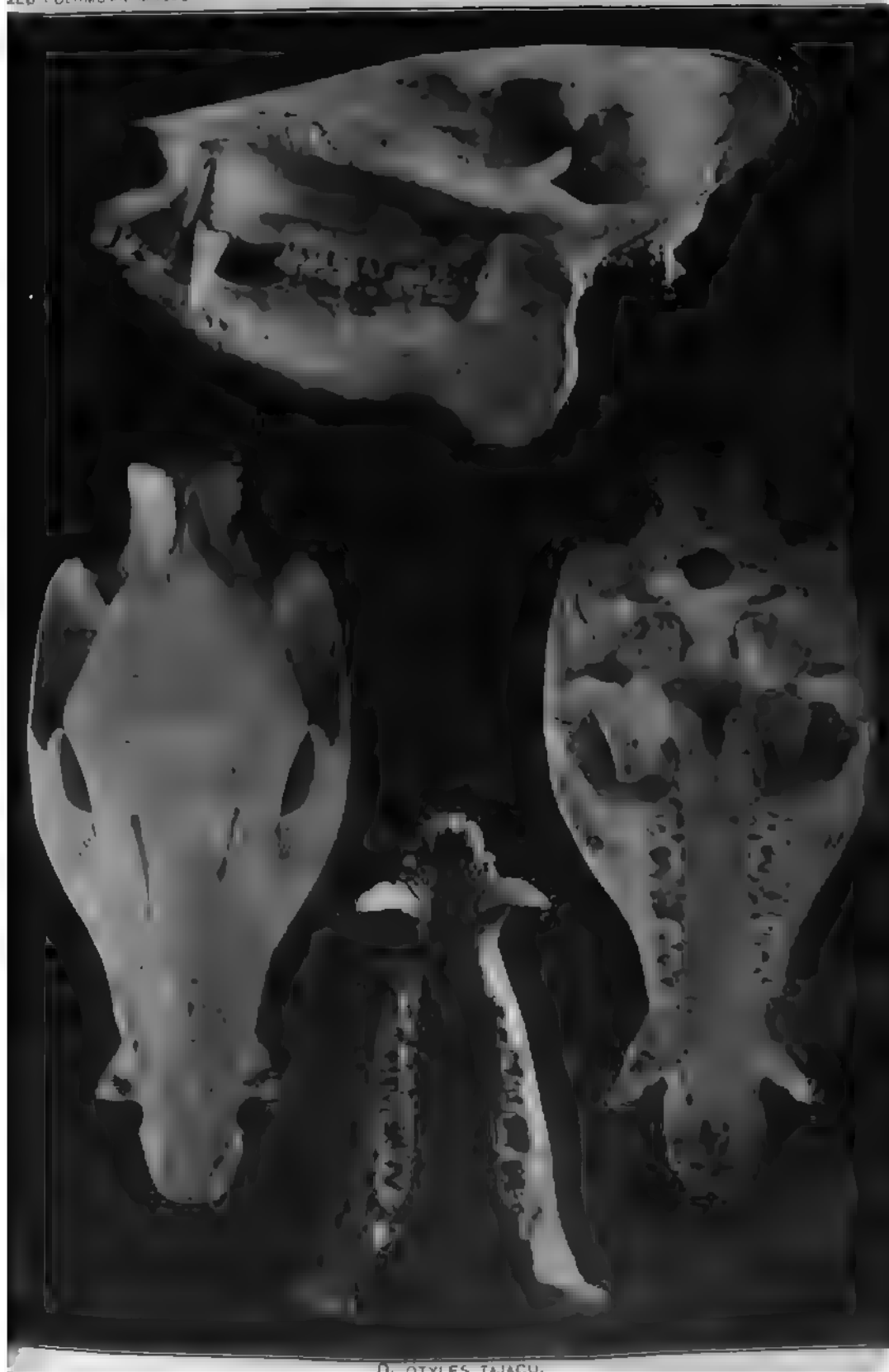
normalis, Gray, Proc. Zool. Soc., 1866, p. 214.

Geogr. Distr. Atlantic to Indian Oceans.

Genl. Char. Similar to *P. plagiodon*, but smaller. Vertebrae 70.

Color. Above dark, grading on sides into the white of belly; sides and fins spotted.

Measurements. Total length 1572; end of beak to dorsal, 858; to pectoral, 390; length of skull, 376; of rostrum, 218; breadth of rostrum at base, 89; interorbital breadth, 164; length of temporal fossa, 71.



D. OTYLES TAJACO.

Order V. **Ungulata.**

Fam. I. **Dicotylidae.**

Snout elongated, truncated, flat terminal naked surface in which the nostrils are situated. Stomach complex; cæcum present.

Sub. Fam. I. **Dicotylinae.**

26. Dicotyles.

$$I. \frac{2-2}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 38.$$

Dicotyles. Cuv. Règn. Anim., 1, 1817, p. 237.

Incisor rooted; upper canines pointed downwards, with sharp cutting edges. Four toes on fore feet, three on hind feet. Upper outer incisor and anterior premolar of both jaws wanting. Third and fourth metapodials united at their upper ends. Ears small, erect. Body covered with bristly hair. Musky gland in middle of back.

49. tajacu. (*Sus*), Linn. Syst. Nat., 1, 1766, p. 103.

Type locality. Mexico.

Geogr. Distr. Red River of Arkansas, latitude 34° south through Mexico, Central and South America to the Rio Negro of Patagonia.

Genl. Char. A white collar on either side of the neck; size small.

Color. Hairs bristly, banded with black and white, the tips being always black, making the upper parts and sides appearing a mixed black and white. Black predominates on face, along the mane and the median line of the dorsal region. The throat, underparts, legs, ears and a patch behind ears, nose and hoofs black. Band extending from either side of neck over shoulders and meeting on back whitish; legs dark brown, sometimes the sides of hoofs are horn color.

Measurements. Total length, 865; head, 280; height at shoulder, 813; tail vertebræ, 12.

Fam. II. **Cervidae.**

Antlers solid, always present on the male, sometimes on the female, first molar in upper and lower jaws brachyodont; lachrymal bone prevented from articulating with the nasals by an extensive anteorbital vacuity; lachrymal duct with two orifices at or inside rim of orbit; lateral hoofs nearly always present on all of the feet. Upper canines generally present; no gall bladder.

Sub. Fam. I. **Cervinae.****27. Cervus.**

$$I. \frac{0-0}{4-4}; C. \frac{1-1}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 34.$$

Cervus. Linn. Syst. Nat., 1758, p. 66.

Antlers only present in male, supported by short pedicles, rising at acute angles to the median line of skull; never regularly forked at first division, and furnished with tines; brow tine present; no ridges on frontals; canine teeth large in American species; lateral metacarpals only represented by the upper ends.

50. canadensis. Erxl. Syst. Regn. Anim., 1777, p. 305.

strongyloceros, Schreb. Säugeth., v, p. 1, pl. ccxlviii.

wapiti, Barton, Am. Phil. Trans., 1869, p. 70.

Type locality. Eastern Canada.

Geogr. Distr. Rocky Mountain region from New Mexico to British Columbia, and from the eastern base of the range westward to about 120th meridian. East of the westward borders of the great plains it is practically extinct, although it may still linger in northern Minnesota and possibly in North Dakota.

Genl. Char. Size very large; antlers with often more than five tines; curving backwards, flattened in upper portion; fourth tine longest; brow and bez tines close together and of nearly equal length; crowns sometimes cup-shaped, caudal disk enormous; mane developed, tail short. Tarsal gland absent, metatarsal present. Lachrymal large, naked.

Color. Summer Pelage. Head, neck and underparts very dark chestnut brown, sometimes black beneath; sides, back and thighs yellowish gray; a white or straw-colored patch on rump uniting with white between the hind legs, the lower border of this patch being black; legs clove brown. Individuals vary considerably in color.

Winter Pelage. Resembles the summer in color, but the hairs are much longer and there is a heavy under coat of fur.

Measurements. Height at withers, 1627; total length, 2973; nose to occiput, 558; tail vertebræ, 213. The dimensions vary greatly and those of one specimen are hardly a criterion for others.

Antlers. Length along outside curve from 1448 to 1655; circumference about bez tine 183-237; tip to tip, 622-1650; widest inside, 902-1398.

a.-occidentalis. (*Cervus*), Smith, Griff, Anim. King., 1827, iv, pp. 101-103.

roosevelti, Merr. Proc. Biol. Soc. Wash., 1897, p. 271.

Type locality. Northwestern America, no definite locality given.



out / nat. size



RANGIFER CARIBOU
No. of Field Columbian Museum Coll. Nearly a pair 9-10.

Geogr. Distr. Vancouver Island, coast ranges of Washington and Oregon to northwestern California.

Genl. Char. Size large; in winter pelage, head, neck and legs black.

Color. Summer Pelage. Not perceptibly different from the Rocky Mountain or eastern Wapiti.

Winter Pelage. Head and neck more or less black; especially on the face and on median line of neck, rest brown; the extent of black varies greatly among individuals; back and side grayish brown; dorsal line dusky; breast and belly reddish chestnut; legs and feet black; black on inner side of thigh curving outward on lower side of rump patch, which is large and buffy fulvous.

Measurements. Total length, 2490; tail, 80; ears, 225; antlers from tip to tip, 990-1130; circumference of burr, 266-370.

28. Rangifer.

$$I. \frac{0-0}{4-4}; C. \frac{1-1}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 34.$$

Rangifer. H. Smith, Griff. Anim. King., v, 1827, p. 304. Type *R. tarandus*, Linn.

Lateral metacarpals represented only by the lower extremities. **Both sexes** bearing antlers; brow tines palmated, compressed laterally, advancing over middle of face and rarely symmetrical; a second or bez tine above the brow tine, also palmated; about midway its length the beams bend forward, and here, posteriorly, is a small tine, and the beam ends in a large palmation with numerous points. Antlers of female much smaller, lighter and simpler. Muzzle entirely hairy; ears and tail short; mane on neck. Tarsal gland present, metatarsal absent. No upper canines. Hoofs deeply cleft.

51. caribou. (*Cervus*), Gmel. Syst. Nat., 1, 1788, p. 177.

tarandus sylvestris, Rich. Faun. Bor. Amer., 1829, p. 250.

hastalis, Agass. Sillim. Jour., 1847, p. 436.

Type locality. Boreal eastern North America.

Geogr. Distr. Labrador, Lower Canada, south to Nova Scotia, New Brunswick and Maine in the east; west through the districts north of Quebec and Lake Superior to Montana and British Columbia, in forest lands.

Genl. Char. Size large; antlers stout, flat, palmation very considerable; one brow tine usually simple. Colors dark on body and limbs; no light ring around eye.

Color. Summer Pelage. Rump, tail, underparts and inside legs pure white; outside of legs dark brown; head, neck and remaining parts clove brown, sometimes reddish; black patch on cheek and

around eye, and white band above hoofs enclosing lateral hoofs behind.

Winter Pelage. Head and neck white, or whitish, rest of coat grayish ash.

Measurements. Total length, 1933; height at withers, 1068; ears, 127.

52. *terraenovae.* (*Rangifer*), Bangs, Boston, Private Pub., 1896,—Allen, Bull. Am. Mus. Nat. Hist., 1896, p. 233.

Type locality. Grand Lake, Newfoundland (Allen), Codroy, Newfoundland (Bangs).

Geogr. Distr. Newfoundland.

Genl. Char. Antlers massive, points numerous, general shape low, widely spread and the points directed forward; white ring around eye.

Color. Autumn Pelage. Above grayish brown; neck soiled white; lower part of face, and ring around eye grayish white; rest of head grayish brown, underparts pure white; front of legs brownish gray, feet white; tail drab above, white beneath; ears drab.

Measurements. Larger than *R. groenlandicus*.

53. *montanus.* (*Rangifer*), Seton Thompson, Ottawa Natur., 1899, p. 129.

Type locality. Illacillewaet watershed near Revelstoke, Selkirk Range, British Columbia.

Geogr. Distr. Mountains of British Columbia, north into southeastern Alaska, east into the Rocky Mountains of Alberta and south into Idaho.

Genl. Char. Size large, color dark, white mark above hoof narrow. Antlers not different from the woodland species.

Color. Lips, neck, belly, buttocks and under side of tail grayish white; rest of pelage deep umber brown, becoming nearly black over lower part of legs. A light grayish patch over ribs. White mark above hoof, very narrow.

Measurements. Total length from end of nose to root of tail, 1930–2413; tail, 127–177.8; nose to occiput, 502; hind foot, 597–660; ear, 115–120; height at withers, 1081–1397.

54. *dawsoni.* (*Rangifer*), Seton Thompson, Ottawa Natur., 1900, p. 260.

Type locality. Graham Island, Queen Charlotte Islands.

Geogr. Distr. Queen Charlotte Islands.

Genl. Char. Size small, color dark but lighter than *R. montanus*.

Color. General hue mouse color.

Measurements. Only those of antlers and part of skull given.



New Brunswick, C. nat. size

From burr to tip along outer curve, $28\frac{3}{4}$ in. (730 mm.); girth above burr, 120; occiput to posterior end of nasals, 166; width across orbits, 153.

55. groenlandicus. (*Cervus*), Gmel. Syst. Nat., 1788, 1, p. 177.

Type locality. Greenland.

Geogr. Distr. Greenland.

Genl. Char. Antlers long, slender, with but few points; white ring around eye, and white line bordering the hoofs.

Color. Summer Pelage. General character clove brown; around the eye a broadly defined white ring; and the hoofs are bordered by a broad white band.

Measurements. Somewhat smaller than *R. caribou*.

56 arcticus. (*Cervus*), Rich. Faun. Bor. Amer., 1829, p. 239.

Type locality. Shores of Hudson Bay?

Geogr. Distr. Barren grounds of Arctic America, north of the tree limit, to the shores and islands of the Arctic Ocean.

Genl. Char. Size small; antlers of male long, slender with comparatively few points; brow and bez tines more or less palmated; back tine usually absent.

Color. Summer Pelage. General tint clove brown mixed with dark reddish and yellowish browns; neck beneath and underparts white.

Winter Pelage. Entire coat soiled white.

Measurements. Similar in size to *R. caribou*.

29. Alces.

$$T. \frac{0-0}{4-4}; C. \frac{1-1}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 34.$$

Alces. H. Smith, Griff. Anim. King., v, 1827, p. 303. Type *Alces machlis*, Linn.

Size, largest of all living deer; lateral metacarpals represented by the lower extremities; antlers possessed only by the male, placed low on skull extending at first outwards and then backwards, expanding into a broad palmation with numerous points; brow tine often palmated and furnished with points. Muzzle large, broad and overhanging, with a small triangular naked area between nostrils; head and legs long; neck and body short; fore legs longest, tail very short; tarsal gland small; lateral hoofs large; main hoofs pointed. Nasal bones short; nasal aperture large; gland pit and interorbital vacuity, moderate. A mass of hair depends from lower part of throat called "the bell."

57. americanus. (*Alces*), Jard. Nat. Libr., 1835, Mamm. p. 125.

machlis, (Linn.), Ogilby, Proc. Zool. Soc., 1836, p. 135.

palmatus, Gray, List Mamm. Brit. Mus., 1843, p. 182.

lobatus, Agass. Proc. Bost. Soc., 1846, p. 188.

muswa, Rich. Zool. of Herald, Mamm., 1852, p. 66.

Type locality. Eastern Canada.

Geogr. Distr. Labrador, Nova Scotia, New Brunswick, Quebec, possibly Ontario; Maine, Minnesota, Montana and north to latitude 69° east of the Rocky Mountains.

Genl. Char. Smaller than Alaskan moose; skull with broader occipital region, narrower palate and lighter mandible.

Color. Winter Pelage. General color black; flanks pale fawn; legs golden brown; forehead dark chestnut.

Summer Pelage. Somewhat lighter in general color. Not infrequently grayish individuals are met with, very different in appearance from the blackish ones.

Measurements. Height at withers as much as 2440; total length, 2110–2190; tail vertebræ, 202–280; height of ear, 355. Weight, 800–1200 pounds. Weight of antlers, 50–60 pounds.

58. gigas. (*Alces*), Miller, Proc. Biol. Soc. Wash., 1899, p. 57.

Type locality. Tustumena Lake, Kenai Peninsula, Alaska.

Geogr. Distr. Alaska.

Genl. Char. Size very large. Skull with narrow occipital region, broad palate and heavy mandible.

Color. Grizzled black and wood brown, darker on dorsal region; breast clear black as are the buttocks and lower sides. Legs hair brown; middle of belly hair brown. Ears broccoli brown, inside yellowish white.

Measurements. Total length, males, 2946–3048; tail vertebræ, 101; height at shoulder, 2034; ear from crown, 304. *Antlers:* Greatest expanse, 1530–1600; tip to tip, 1120–1200; width of palmation, 310–360; least diameter between burr and brow tine, 175–210. Skull: width between tips of paroccipital processes, 160–165; greatest width of palate between tooth rows, 93–101; length of mandible, 480, 485; depth of mandible at posterior end of tooth row, 58–65; greatest depth of mandible, 223–235; least depth of mandible, 31–34; mandibular tooth rows, 152–165.

30. Odocoileus.

$$I. \frac{0-0}{4-4}; C. \frac{0-0}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 32.$$

Odocoileus. Rafin. Atlantic Jour., 1832, 1, no. 3, p. 109. Type (*O.*

spелеus, Rafin. = *C. americanus* Erxl.



COLUMBIAN DEER AND

No. 51 Field Columbian Museum Collection. Little more than 1/2 nat. size.

Size large. Antlers in male only; large, with sub-basal snag; anterior prong of main fork more developed than the posterior one. Metatarsal gland and tuft generally present. Tail usually long, thickly haired beneath. Face gland small; gland pit moderate; upper canines absent.

59. americanus. (*Cervus*), Erxleb. Syst. Regn. Anim., 1777, p. 312.
virginianus, Bodd. Elench. Anim., 1785, i, p. 136.

Type locality. Virginia.

Geogr. Distr. Eastern North America from Ontario, Canada, and Maine to Florida, and west to the Missouri River below the Canadian boundary line.

Genl. Char. Size large; antlers large with sub-basal snag, beyond which the beam is curved forward and soon after forks dichotomously, the lower prong again forking, presenting a beam with three practically vertical tines arising above it. Metatarsal gland well developed and placed low on the leg. Tarsal gland present.

Color. Summer Pelage. General color of head, neck, back sides and legs bright rufous, throat, underparts and inside of legs white; black band across chin; tail dark brown above, white beneath. The shade of color in the summer coat varies greatly from bay to yellowish.

Autumn Pelage. General color bluish gray; throat and underparts white.

Winter Pelage. Yellowish gray above and on sides mottled with brown; throat, around eyes, chin, base of ears posteriorly, inside of thighs and buttocks, and entire underparts and beneath tail pure white. Dusky band across chin. Tail above rusty on basal half, remainder sooty brown.

Measurements. Total length, 2062; tail to end of hairs, 228; nose to occiput, 224. Dimensions in this species as in others of the Cervidæ are of little practical value, as individuals vary so greatly in size. *Antlers:* Length along outer curve 338-694, basal circumference 95-130; tip to tip, 368-505; widest inside, 321-439.

a.—macrourus. (*Cervus*), Rafin. Amer. Month. Mag., 1817, i, p. 436.
leucurus, Doug. Zool. Jour., 1829, iv, p. 330.

Type locality. Plains of the Kansas River.

Geogr. Distr. Kansas, Nebraska and the Dakotas westward to California, Oregon and Washington.

Genl. Char. Similar to *O. americanus*, but smaller and paler in color. Antlers resembling those of the type species, but are inclined to produce three posterior points and are very rough at base in old animals; tail not as long as head; no black on face and tail.

Color. Summer Pelage. Upper parts and outside of limbs reddish brown.

Autumn Pelage. Yellowish gray mixed with black; chin and throat white, dusky spot on side of chin. Throat white; underpart of neck brownish gray; legs pale brownish yellow, underparts white. Tail above reddish brown, beneath white.

Measurements. Total length, nose to end of tail vertebræ, 2287; tail vertebræ, 305; nose to occiput, 448.

b.—texensis. (*Dorcelaphus*), Mearns, Proc. Biol. Soc. Wash., 1898, p. 23.

Type locality. Fort Clark, Kinney county, Texas.

Geogr. Distr. Texas and Mexico.

Genl. Char. Size small; tip and edge of ears black; horns small, incurved; molar teeth large; color pale.

Color. Winter Pelage. Top of head black, sides light ash gray. Upper parts yellowish white and gray mixed; black line from crown to root of tail; sides pale yellowish ash; chest fuliginous, rest of underparts white, chin white with black transverse cross bar, jaws light ash. Throat white. Legs reddish fawn mixed with gray black.

Measurements. Total length, 1585; tail vertebræ, 265; ear from crown, 160; height at shoulder, 880.

Antlers: length of beam on outside curve, 440; widest expanse, 330; circumference of beam at base, 80.

c.—osceola. (*Cariacus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 26.

Type locality. Citronelle, Citrus County, Florida.

Geogr. Distr. Florida.

Genl. Char. Size small, color dark.

Color. Autumn Pelage. Upper parts dark and pale brown mixed; dark brown line from between the ears along neck and back; sides and lower part of neck and flanks, cinnamon; throat and underparts of body white; ears dark brown, inside white. Tail above the hairs dark reddish brown tipped with cinnamon, beneath white.

Midsummer Pelage. Above bright russet cinnamon; tail broadly edged with black at base and black above at tip.

Measurements. Total length, male, 1600; tail vertebræ, 280.

Antlers, widest expanse, 413-636.

d.—couesi. (*Cervus*, Rothrock ms.), Coues & Yarrow in Wheel. Geog. and Geol. Surv., 1875, p. 72.

mexicanus, Baird, N. Am. Mamm., 1857, p. 653, (Part).

virginianus, var., Coues & Yarr. Rep. Geog. Surv. West 100 Merid., 1875, v, pp. 72, 75.

var *Couesi*, Rothrock, Rep. Geog. Surv. West 100 Merid., 1875, v, pp. 72, 75.

Type locality. Camp Crittenden, Arizona. (Wheeler Geog. and Geol. Surv.)

Genl. Char. Smaller than *O. virginianus*; horns similar in shape.

Geogr. Distr. Arizona and Mexico, from the Gila River Valley on the north, in the woody mountain regions south to the City of Mexico.

Color. Summer Pelage. Above pale dull fawn color tinged with ochraceous, dorsal area, mouse gray; sides tawny or reddish brown; throat, underparts and inner side of limbs and around digits white. Tail above reddish brown, fringed with white, beneath pure white.

Measurements. Height at withers, 812; at rump, 902; ears, 197. Skull: occipital condyles to apex of intermaxillaries, 210; width across orbits, 96; interzygomatic width, 90; interparoccipital width, 45; length of nasals, 68; occipital condyles to anterior edge of intermaxillaries, 210.

60. crooki. (*Dorcelaphus*), Mearns, Proc. U. S. Nat. Mus., Wash. 1897, p. 468.

Type locality. Dog Mountains, Grant County, New Mexico.

Geogr. Distr. New Mexico, limits of range not defined.

Genl. Char. Somewhat similar to *O. columbianus*, smaller.

Color. Summer Pelage. Female. Reddish fawn, darkest on back; neck grayish drab, sides grayish cinnamon. Forehead black; legs cream color; hairs on metatarsal gland sooty at base, tips white; tail, upperside and tip black, beneath in middle white, naked basally.

Measurements. Total length, 1440; tail vertebræ, 195; ear above crown, 220.

61. columbianus. (*Cervus*), Rich. Faun. Bor. Amer., 1829, p. 257.

lewisi, Peale, U. S. Expl. Exped. Mamm., viii, p. 39, fig. p. 43.

richardsoni, Aud. & Bach. Quad. N. Am., 111, p. 27, pl. cvi.

punctulatus, Gray, Proc. Zool. Soc., 1850, p. 239, pl. 28.

Type locality. Mouth of the Columbia River.

Geogr. Distr. British Columbia, Vancouver Island and west of the Cascade Mountains in Washington, Oregon and California.

Genl. Char. Smaller than *O. hemionus*; ears shorter; metatarsal gland shorter; tail black above. Antlers like those of Mule Deer.

Color. Winter Pelage. General color brownish gray mottled with black, darkest on dorsal line forming a streak from occiput to root of tail. Top of head chestnut and black; black stripe over the eyes meeting on forehead, chin white, behind is a black patch; face gray; upper throat, posterior portion of underparts and base of tail white; rest of underparts mottled similarly to the back, chest sooty; legs dark cinnamon; inner side white. Tail above black, shading at base into the color of the back, beneath white.

Summer Pelage. General color red or reddish yellow.

Measurements. Total length, 1780; tail vertebræ, 152-228; height at withers, 863.

a.—sitkensis. (*Odocoileus*), Merr. Proc. Biol. Soc., Wash., 1898, p. 101.

Type locality. Sitka, Alaska.

Geogr. Distr. Alaska, limits of range not defined.

Genl. Char. Similar to *O. columbianus*; ears shorter.

Color. Summer Pelage. Fulvous; face grizzled gray; dusky patch from eyes half way to nose; ears mixed gray and dusky; posterior part of belly, inner side of thigh and strip on hind part of fore leg white, remainder of underparts pale fulvous; tarsal gland black with fulvous border. Tail above like back at base grading into black, beneath white.

Measurements. Female from island near Sitka. Total length, 1297; height at withers, 902; tail vertebræ, 165.

b.—scaphiotus, (*Odocoileus*), Merr. Proc. Biol. Soc., Wash., 1898, p. 101.

Type locality. Laguna Ranch, Gabilan Range, California.

Geogr. Distr. Limits of range not defined. Gabilan Range, California.

Genl. Char. Similar to *O. columbianus*; ears larger; colors paler. Skull: lachrymal pit longer and narrower anteriorly.

Color. Winter Pelage. Grizzled gray above; beneath "with white areas as in *columbianus*."

Measurements. Total length, 1463; tail vertebræ, 135; hind foot, 452; ear (skin) from anterior base 178, from notch 168; breadth, 106.

62. hemionus. (*Cervus*), Rafn. Amer. Month. Mag., 1, p. 436.

macrotis, Say. Narr. Long's Exped. Rocky Mts., 1823, 11, p. 88.

auritus, Ward, Desc. Etats Unis, 1820, v, p. 540.

Type locality. Sioux River, probably on eastern border of South Dakota.

Geogr. Distr. West of the Missouri River from Fort George, south to Texas, westwards through Nevada to latitude of San Francisco, including North and South Dakota, Nebraska, Kansas, Texas, Colorado, Wyoming, Montana, Idaho, Nevada, California, Oregon and Washington.

Genl. Char. Size large, body heavy; ears very large, thickly haired; tail moderate, round, white tipped with a black tuft, naked beneath basally; metatarsal gland occupying upper half of outer side of canon bone; tarsal gland present. Antlers with short sub-basal snag, the beam from this projecting outward and then upward forking dichotomously, both prongs nearly equal and then again divide.



ANTILOCAPRA AMERICANA.

No. 70 Field Columbian Museum Coll. About $\frac{1}{4}$ nat. size.

Color. Summer Pelage. Pale dull yellowish or yellowish tawny; this is replaced in the early autumn by a bluish gray coat, growing lighter in color as the hairs lengthen during the winter. A dark brown patch on forehead between the eyes and extending below them on the face; remainder of face and throat white as are also the abdomen, inner side of legs and buttocks; rest of underparts blackish brown. Tail white, tip black; ear bordered with black anteriorly.

Measurements. Total length, male, 1983; tail vertebræ, 203.

Antlers: Length along curve, 393-698; tip to tip, 189-369; widest inside, 369-483.

a.—californicus. (*Cariacus*), Caton, Amer. Nat., 1876, p. 464.

Type locality. St. Julian Ranch. Summit of Gaviota Pass, Coast Range, California.

Geogr. Distr. California south of San Francisco, in the Coast Range.

Genl. Char. Ears smaller than type species; tail longer and differs from that of *O. hemionus* by having a dark median stripe on top, metatarsal gland very large.

Color. Similar to *O. hemionus*, the main difference apparently being that this form has the top of the tail covered by a dark line embracing one-third of its circumference; underside of tail naked, tip black.

Fam. III. **Antilocapridae.**

Horns branched, deciduous, allied to the Bovidae.

31. **Antilocapra.**

$$I. \frac{0-0}{4-4}; C. \frac{0-0}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 32.$$

Antilocapra Ord, Journ. de Phys., 1818, p. 149. Type *Antilope americana*, Ord.

Dicranocerus, H. Smith, Griff. Anim. King., 1827, p. 312.

Horns compressed at base; flattened process in front, end conical, recurved; deciduous; lateral hoofs absent; hair stiff, coarse, brittle. Nose hairy, save a narrow line in the center. Tail very short. Horns in the female rudimentary or absent.

63. americana. (*Antilope*), Ord, Guth. Geog., 2d Am. ed., 11, 1815, p. 292.

Type locality. Plains east of the Missouri River? Black Mountains?

Geogr. Distr. Valley of the Saskatchewan, latitude 53° south to Mexico, and from Missouri River on plains westwards to Rocky Mountains and the Cascade Range in Oregon and Washington.

Genl. Char. Size of domestic sheep, with much longer legs and neck; eyes large, gazelle-like; no lachrymal gland, low mane on back of neck.

Color. Male. Upper parts and sides yellowish brown; band between eyes covering forehead, nose and a spot below ear, liver-brown; sides of head, spot behind ear, throat, front of neck extending in two triangles into the brown on either side, entire underparts and rump white. Legs yellowish brown. Horns, hoofs and naked skin on nose black.

Measurements. Total length, 1245; tail, 178; height at withers, 780.

Fam. IV. **Bovidae.**

Horns hollow, unbranched, non-deciduous, usually smaller in the female, affixed on bony appendages to the skull. Molars often hypsodont; orifice of lachrymal canal inside rim of orbit; lower ends of metacarpals and metatarsals absent; canine is wanting; gall bladder usually present. Lateral hoofs sometimes absent.

Sub-Fam. I. **Rupicaprinae.**

32. **Oreamnus.**

$$1. \frac{0-0}{4-4}; C. \frac{0-0}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 32.$$

Oreamnos Rafin. Amer. Month. Mag., 1817, 11, p. 44. Type *Ovis montana*, Ord.

Haplocerus, H. Smith, Griff. Anim. Kingd., 1827, v, p. 354.

Size moderate; chin with short beard; nose hairy; horns small curving slightly backward; ringed at base; lateral hoofs present. Hair long, pendant; fur short, woolly.

64. montanus. (*Ovis*), Ord, Guth. Geog., 2nd Am. ed., 11, 1815, p. 292.

Type locality. Mountains adjacent to Brant Island, Columbia River, Oregon.

Geogr. Distr. Higher portions of the Rocky Mountains and other high ranges lying between them and the Pacific, to Alaska. Not found in the Olympic Range.

Genl. Char. The same as those of the genus.

Color. Entirely yellowish white. Horns and hoofs black.

Measurements. Total length, 1018; tail vertebræ, 25; horns, 203–257; circumference at base, 82–143.

65. kennedyi. Elliot, Pub. Field Columb. Mus., 1900, 111, p. 1.
Zoölogy.

Type locality. Mountains at mouth of Copper River, opposite Kyak Island, Alaska.

Genl. Char. Frontals much depressed anterior to horn cores;



OREAMNUS KENNEDYI.

374 Field Columbian Museum Coll. Nearly $\frac{1}{2}$ nat. size.



OREAMNUS MONTANUS.

. 15752 Am. Mus. Nat. Hist. Coll. Nearly $\frac{1}{2}$ nat. size.

nasals narrow, flat; interparietal with nearly straight anterior outline; basisphenoid and presphenoid narrow, contracted; palate wide. Horns spreading outward from base, turning backwards at tips, ribbed for half their length, then smooth for remaining portion.

Color. *White. Horns brownish black on ribbed part, black on smooth portion.

Skull. Superior outline highest between horn cores, descending rapidly with a concave curve anteriorly to end of frontals, and posteriorly with a convex curve to occiput; nasals flat on top, rounded at posterior end, and terminating in a point anteriorly, and widest about midway their length. The horn cores are concave, "scooped out," on the inside, not rounded, and the points incline outward, causing the exterior lateral outline to be slightly curved and permitting the wide expanse that exists at the tips of the horns. The malar is long and narrow and terminates anteriorly in a somewhat lengthened point, while the lacrymal is rather wide for its length. The parietals are considerably depressed at the posterior base of the horn cores, and the interparietal is rounded anteriorly, entirely without the central point so conspicuous in the same bone of the Rocky Mountain goat skull. On the inferior surface of the skull the basioccipital is almost square, slightly contracted midway. The wall of the foramen magnum between the occipital condyles has been cut away. The basisphenoid is greatly contracted and very narrow for most of its length, and the visible portion of the presphenoid terminates almost in a point. The ptergoid fossa is wide for its entire length, broadest between the hamular processes. Palate very broad for its length, and the palatal arch has a blunt median azygos process.

The mandible has a broad, flat condyle, a rounded angle projecting outward nearly on a line with outer edge of condyle; horizontal portion slender, with only a slight curve to the inferior outline. Coronoid process long, narrow, curving gradually backwards.

Measurements. Occipito-nasal lengths, 273 mm.; foramen magnum to anterior end of premaxillaries, 243; interorbital width, 75; length of frontal, 82; of nasals, 99; greatest width of nasals, 30; mastoid breadth, 79; zygomatic width, 102; width of palate between second molars, 46; length of incisive foramina, 40; length of horn core, 74.

Horns. Commence to curve outward from the base, turning backwards at the tips, strongly ribbed for half their length, and smooth for the remaining portion. Total length along curve, 244; around base, 108; tip to tip, 303.

* Scalp was on the skull.

33. Ovis.

I. $\frac{1-2}{1-4}$; C. $\frac{2}{2} \frac{0}{0}$; P. $\frac{3-3}{3-3}$; M. $\frac{3}{3} \frac{3}{3} = 32$.

Ovis. Linn. Syst. Nat., 1766, p. 97. Type *O. ammon*, Linn.?

Body stout, legs rather short; neck of moderate length; nose narrow pointed; small naked space between nostrils, rest hairy; chin beardless; ears small, pointed, upright, hairy; tail short, pointed; lateral hoofs present; glands between hoofs present, and often on face below eyes; canon bones long and slender. Skull broadest between eyes, then narrowing rapidly to nose. Horns curving backwards and then downwards in a majestic sweep; tips averted; transverse ridges prominent.

66. cervina. (*Ovis*). Desm. Nouv. Dict. Hist. Nat., 1804, p. 5; nouv. ed., 1818, xxi, p. 553.

canadensis, Shaw, Nat. Misc., 1804, ? pl. 610.

ammon, Mitch. (nec Linn.), Med. Rep., 1807, p. 35.

montana, Cuv. (nec Ord.), Règn. Anim., 1, 1817, p. 267.

pygarga, H. Smith, Griff. Anim. King., 1827, p. 318.

californianus, Dougl. Zool. Journ., 1828, p. 332.

Type locality. Rocky Mountains between the Kootenai Pass and Mount Mead, N. lat. 50° W., long. 115, Alberta.

Geogr. Distr. High mountain ranges from the Colorado River and Arizona north into British Columbia.

Genl. Char. Size large; ears broad, pointed, moderately haired; no mane; caudal disk large, conspicuous; horns massive in the male, thick, keel on outer front edge, tips usually broken in adult animals and directed forward; spiral short. Horns of female short, ribbed at base pointing backward and outward.

Color. Above grayish brown, dark line along center of the back; face ashy gray, neck grayish brown tinged with plumbeous; underparts, buttocks, inner side of legs, on each side of base of tail and upper part of throat whitish; legs dark grayish brown; tail above like the back.

Autumn Pelage. General color a bluish gray white, the hairs are short, changing as they lengthen to the coat described above.

Measurements. Height at withers, 1000-1070; girth around chest, 1170-1245.

Horns: Length along front curve, 928-1143; basal circumference, 356-458.

a.—nelsoni. (*Ovis*), Merr, Proc. Biol. Soc., Wash., 1897, p. 217.

Type locality. Grapevine Mountains, boundary line of Nevada and California.

Geogr. Distr. Limits of range not defined. Grapevine Range.



Genl. Char. Similar apparently to *O. stonei* but paler.

Color. Above pale, dingy brown; caudal disk, posterior part of belly, inner side of thighs, and hind part of legs, white; rest of underparts and legs dark brown.

Measurements. Total length, 1280; tail vertebræ, 100; hind foot, 360; height at shoulder, 830.

67. stonei. (*Ovis*), Allen, Bull. Am. Mus. Nat. Hist., 1897, p. 111, pts. 1, 2.

liardensis, Lydekker, Wild Oxen, Sheep and Goats, 1898, p. 215.

Type locality. Che-on-nee Mountains, Coast Range, British Northwest Territory.

Geogr. Distr. From Cassiar Mountains 61° north latitude, and south to the head waters of the Nelson and Peace Rivers, Rocky Mountains; west to longitude 134°. Also found in the Stickeen, Cheonnees and Etsezas Mountains, Alaska.

Genl. Char. Color, dark gray or blackish brown; horns slender, curving outwards at tips.

Color. Above blackish brown and whitish mixed; a broad blackish stripe from occiput to base of tail; face and sides of neck paler; front of neck, chest and sides almost black; caudal disk, back of thighs and underparts to center of chest, where it ends in a point, and back of legs white; outside of legs blackish brown. Tail black, some white hairs on lower surface; hoofs black; horns pale brown.

Measurements. Total length, 1676; tail vertebræ, 89; nose to base of ear, 305.

Horns. Length over curve, 762; tip to tip, 552; circumference at base, 324. (Mounted specimen.)

68. dalli. (*Ovis*), Nelson, Proc. U. S. Nat. Mus., 1884, p. 12.

Type locality. Fort Reliance, Upper Yukon River.

Geogr. Distr. "Alaskan Mountains and the Kenai Peninsula; Rocky Mountains north of latitude 60°, to near the Arctic coast west of the Mackenzie, ranging thence west to the headwaters of the Noatak and Kowak Rivers, that flow into Kotzebue Sound." (A. J. Stone.)

Genl. Char. White or yellowish white at all seasons.

Color. Entirely whitish, hairs usually tipped with rusty. Sometimes specimens have certain parts brownish, but this does not seem to be confined to any particular spot.

Measurements. Male. Total length, 1476; tail, 102; height at shoulder, 991; length of tarsus, 419.

Horns. Length along curve, 375-990; circumference at base, 219-368.

34. Ovibos.

$$I. \frac{0-0}{4-4}; C. \frac{0-0}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 32.$$

Ovibos. De Blainv. Bull. Soc. Philom., Paris, 1816, p. 76. Type *B. moschatus*, Zimm.

Size medium; neck short; muzzle hairy save a naked, triangular space between the nostrils; no face glands; tail rudimentary; hoofs broad, asymmetrical; lateral hoofs large; flesh between hoofs covered with hair. Both sexes horned; largest in male, those of latter in adults, approximating at base, beginning near to the occiput, spreading nearly to the eyes, flattened and grooved at base, curving at first outwards and downwards and then upwards at tips. Molars, caprine. Pelage, long, shaggy; uniform coloration.

69. moschatus. (*Bos.*), Zimm. Geog. Geschichte, 1780, 11, p. 86.

pallantis, H. Smith, Griff. Anim. King., iv, 1827, p. 375.

pallasi, DeKay, Ann. Lyc., New York, 11, 1828, p. 29.

canaliculatus, Fisch. Mem. Acad. Mosc., 111, 1834, p. 287.

Type locality. Region about Hudson Bay.

Geogr. Distr. Arctic America from Mackenzie River and north of 60th parallel to the north of Greenland, south to Melville Bay and Sabine Island.

Genl. Char. Those of the genus.

Color. Dark brown, blackish on head and neck and sides of body in adult males; on middle of back a saddle-shaped patch of yellowish white.

Measurements. Total length, 1878; height at withers, 1250.

Horns. Length along outer curve, 546-755; width at base, 222-318; tip to tip, 502-762.

35. Bison.

$$I. \frac{0-0}{4-4}; C. \frac{0-0}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 32.$$

Bison. H. Smith, Griff. Anim. King., 1827, v, p. 373. Type *Bos bonasus*, Linn.

Horns cylindrical, thick at base, short, tapering rapidly to a point, directed outward and slightly upward for half their length, then bending abruptly upwards; widely separated from each other and resting on a ridge below the vertex of the skull. Forehead short and wide; eye sockets not far removed from base of horns, and tubular in shape; nasals short and separated by a wide space from the premaxillæ. Neural spines of the dorsal vertebræ, and that of the seventh cervical vertebræ very high but descending rapidly in a curve to the lumbar. These support and shape the so-called "hump." Hoofs



Oribos moschatius,

No. 327 Field Columbian Museum Coll. Less than \times nat. size.



broad, short; sides rounded, muzzle broad, naked. Tail moderately long, withers high, hind quarters low, weak; head and shoulders and fore legs to knees covered by a shaggy mane.

70. americanus. (*Bos*), Gmel. Syst. Nat., 1788, vol. 1, p. 204.

Type locality. Texas.

Geogr. Distr. Practically extinct in the wild state, a few survive in the Yellowstone National Park, and some are said to be in the Pan Handle of Texas.

Genl. Char. Those of the genus.

Color. Head, neck, chest and shoulders blackish brown, sometimes black without any brown; remainder of coat paler, grading on rump to cinnamon. Muzzle, horns and hoofs black.

Measurements. Males. Total length, 2949; height at withers, 1742; girth at shoulders, 3050. Specimen from Kansas in Field Columbian Museum. Measured in the flesh.

a.—athabascæ. (*Bison*), Rhoads, Proc. Acad. Nat. Scien., Phil., 1897, p. 498.

Type locality. Fifty miles southwest of Fort Resolution, Great Slave Lake.

Geogr. Distr. "Wooded uplands of Northwest Territories. Formerly from the east slope of the Rocky Mountains to the 95th meridian, and from latitude 63° to latitude 55°; probably south along the Rocky Mountains to the United States."

Genl. Char. Larger and darker generally than *B. bison*; horns more slender, longer and more incurved.

Color. Light brown, shading to dark brown, becoming nearly black on head, legs and belly. Ears, muzzle, hoofs, horns and end of tail, black.

Measurements. Height at shoulders, 1703; height to rump, 1602; total length, 2846. Skull: Frontal width between bases of horn cores, 343; length of horn core along curve, 293; horns along curve inside, 533; tip of horn to its base, 229. Type specimen in the Ottawa Museum, Canada.

Order VI. **Rodentia.**

Coues & Allen, *Monograph of North American Rodentia*, U. S. Geol. Surv., 1877, xl.

Fam. I. **Sciuridae.**

Tail without scales, cylindrical, bushy, hairs long; distinct post-orbital processes; infra-orbital opening small; molars rooted, tubercular; first upper premolar small.

Sub. Fam. I. **Sciurinae.**

O. Bangs, *A Review of the Squirrels of Eastern North America*, Proc. Biol. Soc. Wash., 1896, p. 145.

E. W. Nelson, *Revision of the Squirrels of Mexico and Central America*, Proc. Wash. Acad. Scien., 1899, pp. 15-106.

36. Sciurus.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{1-1}; M. \frac{3-3}{3-3} = 22.$$

Sciurus. Linn. Syst. Nat., 1758, 1, p. 64. Type *S. vulgaris*, Linn.

Guerlinguetus. Gray, Lond. Med. Repository, 1821, p. 304.

Macroxus. F. Cuv. Dict. Scien. Nat., 1829, lix, p. 474.

Rheithrosciurus. Gray, Ann. Mag. Nat. Hist., 1867, p. 272.

Rhinosciurus. Gray, Ann. Mag. Nat. Hist., 1867, p. 275.

Neosciurus. Trouess. Le Nat., 1880, 11, p. 292.

Parasciurus. Trouess. Le Nat., 1880, 11, p. 292.

Echinosciurus. Trouess. Le Nat., 1880, 11, p. 292.

Microsciurus. Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 332.

Hesperosciurus. Nelson, Proc. Wash. Acad. Scien., 1899, p. 27.

Otosciurus. Nelson, Proc. Wash. Acad. Scien., 1899, p. 28.

Aræosciurus. Nelson, Proc. Wash. Acad. Scien., 1899, p. 29.

Baiosciurus. Nelson, Proc. Wash. Acad. Scien., 1899, p. 31.

Tail broad, long, bushy, hairs mostly directed laterally; ears moderate, hairy, sometimes with long tufts at tip; no cheek pouches; skull rather short, broad; postorbital processes directed downward and backward and well developed; upper premolars one, sometimes two, in the latter case the first is very small; anteorbital foramen slitlike, placed anteriorly to the zygomatic process of the maxillary.

A. Parasciurus, Trouess.

Premolars, $\frac{1-1}{1-1}$. Skull: brain case narrow at occiput, not inflated over parietal region, long, narrow; rostrum long, broad; nasals broad, molar series large, heavy.



FIG. 10. *SCIURUS (PARASCIURUS) NIGER*.
No. 431 Field Columbian Museum Coll. Nat. size.

71. *niger*. (*Sciurus*), Linn. Syst. Nat., 1758, 1, p. 64.
cinereus, Linn. Syst. Nat., 1758, 1, p. 64. (Part).
vulpinus, Gmel. Syst. Nat., 1788, 1, p. 147.
capistratus, Bosc. Ann. Mus., 1808, 1, p. 281.
Type locality. South Carolina?

Geogr. Distr. Virginia to Florida east of the Alleghanies, and Gulf coast to Louisiana.

Genl. Char. Large; color variable; nose and ears white. Pelage harsh.

Color. Varying from glossy black to clay color mingled with black above, clay color below. Tail mixed black and clay color. Nose and ears ALWAYS WHITE. Top of head usually black.

Measurements. Total length, 638.46; tail vertebræ, 304.13; hind foot, 87.81.

72. ludovicianus. (*Sciurus*), Custis, Bart. Med. Phys. Jour., 11, 1806, p. 43.

rufiventer, Desm. Mamm., 11, 1822, p. 332. (New Orleans).

macroura, Say, Long's Expedition Rocky Mountains, 1, 1823, p. 115. (Kansas).

magnicaudatus, Harlan, Faun. Am., 1825, p. 178.

subauratus, Bachm. Proc. Zool. Soc., 1838, p. 87.

auduboni, Bachm. Proc. Zool. Soc., 1838, p. 97.

occidentalis, Aud. & Bachm. Journ. Acad. Nat. Sci. Phila., 1842, p. 317.

rubricaudatus, Aud. & Bachm. Quad. N. Am., 11, 1851, p. 30, pl. lv.

sayi, Aud. & Bachm. Quad. N. Am., 11, 1851, p. 274, pl. lxxxix.

Type locality. Red River of Louisiana.

Geogr. Distr. Mississippi Valley from Louisiana to South Dakota and Michigan, and from Western Alleghanies to eastern border of plains.

Genl. Char. Smaller than *S. niger*; ears and nose NEVER WHITE; colors variable; winter pelage soft, ears tufted.

Color. Above, wholly black, to a mixed black and rufous; underparts bright ferruginous; deepest on upper surface of feet and lower surface of tail.

Measurements. Average total length, 541.5; tail vertebræ, 252; hind feet, 73.7.

α.—vicinus. (*Sciurus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 150.

cinereus, Le Conte, App. McMurt. Cuv., 1831, p. 433.

vulpinus, Schreb. Säugth., iv, 1792, p. 772. (nec. Gmel).

Type locality. White Sulphur Springs, West Virginia.

Geogr. Distr. Formerly from northern Virginia to southern New England; now from mountains of West Virginia northward into western Pennsylvania.

Genl. Char. Size larger than *S. ludovicianus*; less ferruginous; belly usually white; tail beneath ferruginous.

Color. Ears never white, but nose sometimes of that hue; above mixed black and rusty; beneath pale ferruginous or rusty white; ears and tail beneath ferruginous.

Measurements. Total length, about 587; tail vertebræ, 271; hind foot, 73.

b.—limitis. (*Sciurus*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 331.

Type locality. Devil's River, Texas.

Geogr. Distr. Texas, southward into Mexico.

Genl. Char. Smaller than *S. carolinensis*; hairs short and close pressed. Upper molars four. Feet small.

Color. Upper parts mixed cinnamon and black; sides of head, limbs and under parts, light cinnamon brown; feet above tinged with rusty; tail above similar to back but more yellowish, beneath uniform cinnamon darker than belly. The color of ventral surface varies from pure white to deep orange among individuals.

Measurements. Total length, 532; tail to end of hairs, 280; hind foot, 64.5.

B. *Neosciurus*, Trouess.

Premolars, $\frac{2-2}{1-1}$. Skull lengthened; rostrum long, compressed; nasals quite long, not extending to posterior end of premaxillaries and narrowed posteriorly; zygomata ascending obliquely, the process of the squamosal abruptly descending. Cranium generally lengthened and narrow. Molar series moderately heavy.

73. *carolinensis.* (*Sciurus*), Gmel. Syst. Nat., 1, 1788, p. 148.

Type locality. Carolina.

Geogr. Distr. Eastern United States from southern New York to northern Florida, and westward south of Pennsylvania to Missouri, Indian Territory and to edge of the plains.

Genl. Char. Medium; colors constant dark yellowish rusty above, white below; pelage soft.

Color. Above dark yellowish rusty; hairs of tail yellow at base, then black, and tips white; under parts white; ear yellowish white.

Measurements. Total length above, 450; tail vertebræ, 212; hind foot, 60.8.

a.—leucotis. (*Sciurus*), Gapper, Zool. Journ., 1830, v, p. 206.

cinereus, Schreb. Säugth., 1792, iv, p. 766, pl. ccxcii.

pennsylvanicus and hiemalis, Ord, Guth. Geog., 2nd Am. ed., 1815, 11, p. 292.

niger, Godman, (nec Linn.). Am. Nat. Hist., 1826, 11, p. 133.

vulpinus, DeKay, N. Y. Zool., 1842, 1, p. 59, (nec Gmel., nec Schreb).

migratorius, Aud. & Bach. Quad. N. Am., 1849, 1, p. 265, pl. xxxv.

Type locality. Region between New York and Lake Simcoe, Ontario, Canada.

Geogr. Distr. Alleghanies of Pennsylvania north through New York and New England to southern New Brunswick and southern Canada, west to Minnesota.

Genl. Char. Size large; tail long, bushy.



FIG. 11. SCIURUS (NEOSCIURUS) CAROLINENSIS.

No. 398 Field Columbian Museum Coll. Nat. size.

Color. Above silvery gray; under parts white, rusty sometimes on neck or chest; tail hairs yellowish at base, then black broadly tipped with white; ears yellowish white. Melanistic individuals not uncommon.

Measurements. Total length, 503; tail vertebrae, 230; hind foot, 71.

b.—hypophaeus. (*Sciurus*), Merr. Scien., 1886, viii, p. 351.

Type locality. Elk River, Minnesota.

Geogr. Distr. Minnesota forest belt. Range unknown.

Genl. Char. Size large; pelage dark, only small white streak on belly.

Color. Upper parts dark iron gray mixed with yellow and rusty; under parts similar to back with a central white streak on belly; sometimes the chest and neck beneath are yellowish brown; tail iron gray; ear tufts in winter yellowish white.

Measurements. Total length about 496; tail vertebræ, 220; hind foot, 67.

c.—fuliginosus. (*Sciurus*), Bachm. Proc. Zool. Soc., 1838, p. 96.

Type locality. New Orleans, Louisiana.

Geogr. Distr. Coast region of Louisiana.

Genl. Char. Size large; under parts never pure white, tail only slightly tipped with white.

Color. Upper parts yellow ferruginous varied with black; tail dark, subapical band broad, and white tip narrow; under parts from buffy ferruginous to smoke gray.

Measurements. Total length, 467; tail vertebræ, 219; hind foot, 67.

d.—extimus. (*Sciurus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 158.

Type locality. Miami, Dade County, Florida.

Geogr. Distr. South Florida.

Genl. Char. Smallest of *S. carolinensis* series; color light; tail short.

Color. Upper part yellowish gray; tail light gray; under parts white; ear tufts white.

Measurements. Total length, average, 438.4; tail vertebræ, 190; hind foot, 47.

O. *Hesperosciurus*, Nelson.

Premolars, $\frac{2-2}{1-1}$. Skull large, long and broad, especially across parietal region, where the brain case is depressed; zygomatic process of squamosal horizontal, arch obliquely ascending but less than in *Neosciurus*. Rostrum deep; nasals long, broad anteriorly and ending on a line with the premaxillaries posteriorly. Molar series very heavy.

74. griseus. (*Sciurus*), Ord, Guth. Geog., 1815, p. 292.

fossor, Peale, U. S. Expl. Exped., Mamm. and Birds, 1848, p. 55.

hermanni, LeConte, Proc. Acad. Nat. Sci. Phil., 1852, p. 149.

leporinus, Hensh. Ann. Rep. Engin., 1876, p. 25.

Type locality. Southwestern Washington, western Oregon, California.

Geogr. Distr. Northern California, Oregon and Washington.

Genl. Char. Size large; tail vertebræ as long as body and head. Upper molars, five. Skull long, broad, rostrum broad, deep.



FIG. 12. *SCIURUS (HESPEROSCIURUS) GRISEUS*.
No. 6608 Field Columbian Museum Coll. Nat. size.

Color. Above grizzled bluish gray and black; under parts pure white; tuft at base of ear chestnut; tail mixed gray, white and black, with a white border, beneath grizzled grayish white.

Measurements. Total length, 565; tail vertebræ, 257; hind foot, 77; ear, $30\frac{1}{2}$.

α.—nigripes. (*Sciurus*), Bryant, Proc. Cal. Acad. Scien., 1889, p. 25.

Type locality. San Mateo County, California, south of San Francisco.

Geogr. Distr. Red Wood belt, coast region of California, south of San Francisco.

Genl. Char. Feet dark brown or black; back reddish brown.

Color. Differs from *S. griseus* in having the back and upper parts generally reddish brown; top of head dark gray tinged with reddish

brown, and feet blackish. Tail above blackish, with white exterior border, beneath pale gray in center, bordered with black and fringed with white.

Measurements. Total length, 545; tail vertebræ, 285; hind foot, 75.

b.—anthonyi. (*Sciurus*), Mearns, Proc. U. S. Nat. Mus., 1897, p. 501.

Type locality. Campbell's Ranch, Laguna, San Diego County, California.

Geogr. Distr. Interior of Southern and Lower California.

Genl. Char. Similar to *S. griseus*, but faintly suffused with brown on back.

Color. Above, gray suffused with yellowish brown; orbital ring and under parts white; feet yellowish brown, gray and black mixed, edged with white; ears at base tawny ochraceous. Tail gray above tipped with white, beneath gray bordered with black and fringed with white.

Measurements. Total length, 540; tail vertebræ, 270; hind foot, 79; ear from crown, 28.

D. *Otosciurus*, Nelson.

Premolars, $\frac{2-2}{1-1}$. Skull very broad, rather short; brain case depressed posteriorly, inflated laterally; rostrum compressed; nasals narrowing posteriorly and extending beyond the premaxillaries. Molar series very heavy.

75. *aberti.* (*Sciurus*), Woodh. Proc. Acad. Nat. Scien. Phil., 1852, p. 220.

dorsalis, Woodh. (nec Gray), Proc. Acad. Nat. Scien. Phil., 1852, p. 110.

castanonotus, Baird, Mamm. N. Am., 1857, p. 266.

Type locality. San Francisco Mountains, New Mexico.

Geogr. Distr. Arizona, New Mexico and mountains of Colorado.

Genl. Char. Above grizzly gray, median stripe chestnut.

Color. Upper parts grizzled bluish gray; broad dorsal stripe chestnut; black lateral stripe, feet and under parts white; ear tufts glossy black tinged with chestnut. Tail above blackish fringed with white; beneath pure white.

Measurements. Total length, 521; tail vertebræ, 229; hind foot, 62; ear, 55.

n.—concolor. (*Sciurus*), True, Proc. U. S. Nat. Mus., 1894, p. 241.

Type locality. Loveland, Larimer County, Colorado.

Geogr. Distr. Northeastern Colorado.

Genl. Char. Similar to *S. aberti*, but no chestnut on back; tail same on both sides.

SCIURUS.



FIG. 13. *SCIURUS (OTOSCIURUS) ABERTI*.
No. 2529 Field Columbian Museum Coll. Nat. size.

Color. Entire upper parts gray; under surface of body and limbs white; upper part of feet gray, toes white; ears gray with lengthened tufts, black mixed with gray, and chestnut. Tail same above and below, gray bordered with black and fringed with white.

Measurements. Total length, 495; tail vertebræ, 215; ear from occiput, 22; hind foot, 61.

E. Aracocciurus. Nelson.

Premolars, $\frac{1-1}{1-1}$. Skull broad, flat, not contracted posteriorly; depressed between orbits; nasals long as interorbital width, extending posteriorly to end of premaxillaries.

76. apache. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1893, p. 29.
griseoflavus, Thomas, (nec Gray), Proc. Zool. Soc., 1882, p. 372.

Type locality. Northern Chihuahua, Mexico.

Geogr. Distr. Chihuahua Mountains, Arizona, south into Mexico in the Sierra Madre to Durango.

Genl. Char. Size large, back yellowish gray; tail long, bushy,

vertebræ nearly equal to head and body. Rostral portions of skull short and broad, nasals little narrowed posteriorly.

Color. Summer Pelage. Upper parts, including nose and base of tail, iron gray washed with yellow; crown and back blackish; flanks washed with pale yellowish; sides of head gray mixed with black and fulvous; under parts and feet buffy yellow to orange yellow, sometimes suffused with rusty. Orbital ring varying from buffy white to fulvous; ears gray tinged with buff; outside of hind legs gray suffused with rusty. Tail above black washed with pale or rusty yellow and fringed with yellowish white, beneath with a median area of ferruginous orange or rusty rufous, bordered with a broad black band and fringed with pale yellowish.

Measurements. Average of five adults: Total length, 565.8; tail vertebræ, 279; hind foot, 79.2.

77. *arizonensis*. (*Sciurus*), Coues, Am. Nat., 1867, p. 357.



FIG. 14. SCIURUS (ARAEOSCIURUS) ARIZONENSIS.
No. 1705 Field Columbian Museum Coll. Nat. size.

colliaci, Allen, Mon. Rod., 1877, p. 738, (nec Rich).

Type locality. Fort Whipple, Arizona.

Geogr. Distr. Arizona.

Genl. Char. Smaller than *S. carolinensis*; tail as long as head and body; soles naked to heels.

Color. Above mixed gray, black, white and tawny; the latter predominating; sides and limbs outside grizzled gray and white. Beneath and inside of limbs pure white. Tail above at base gray and white, remainder black mixed with white and fringed broadly with white; beneath tawny in the center bordered with black and fringed with white.

Measurements. Total length, 478; tail vertebræ, 240; hind foot, 58; height of ear, 20.

a.—huachuca. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 349.

Type locality. Huachuca Mountains, Arizona.

Geogr. Distr. Huachuca Mountains, Southern Arizona.

Genl. Char. Similar to *S. arizonensis*, but nearly uniform gray above, only a trace of a fulvous dorsal stripe.

Color. Upper parts gray; dorsal stripe nearly obsolete; sides lighter gray; nape patch pale fulvous; tail above black sprinkled with white, and fringed broadly with white; beneath pale chestnut, bordered with black and broadly fringed with white. Under parts of body and limbs pure white.

Measurements. Total length, 540; tail vertebræ, 265; hind foot, 70; ear, 34.

E. *Tamiasciurus*, Trouess. 1880.

J. A. Allen. *Revision of the Chickarees or North American Red Squirrels* (*Subgenus Tamiasciurus*). Bull. Am. Mus. Nat. Hist., 1898, p. 249.

Premolars, $\frac{2-2}{1-1}$ or $\frac{1-1}{1-1}$. Skull short, broad, depressed between orbits, superior outline greatly curved, highest point between post orbital processes of the frontal; rostrum short, deep, broad; nasals broad, not equal to interorbital width; squamosal process of zygoma projecting outward, curving gradually downward. Molar series rather heavy comparatively.

78. hudsonius. (*Sciurus*), Erxleb. Mamm., 1777, p. 416.

Type locality. Hudson Strait.

Geogr. Distr. Boreal North America, Labrador, west to Rocky Mountains, and Alaska.

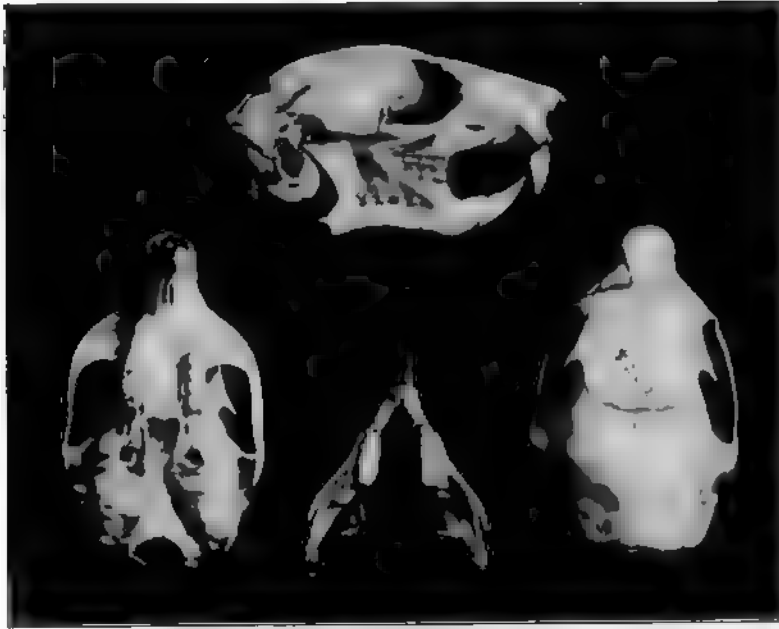


FIG. 15. SCIURUS (TAMIASCIURUS) HUDSONIUS.
No. 8202 Field Columbian Museum Coll. Nat. size.

Genl. Char. Size small, tail short, narrow; a dorsal stripe in winter, chest not rufous; under parts white vermiculated with black.

Color. Winter Pelage. Upper parts and dorsal stripe chestnut rufous; sides olivaceous gray; under parts grayish white. Tail above in center yellowish rufous, with a broad border and sub-terminal bar of black fringed with yellowish rufous; beneath yellowish gray bordered and fringed as above.

Summer Pelage. No dorsal stripe; upper parts yellowish rufous; conspicuous black lateral line; under parts pure white; no ear tufts; tail as in winter, less full.

Measurements. Total length, 296-333; tail vertebræ, 89-134; hind foot, 43-48.

a.-gymnicus. (*Sciurus*), Bangs, Proc. New Eng. Zool. Club, 1899, p. 28.

Type locality. Greenville, Maine.

Geogr. Distr. Eastern North America south of Labrador to Northern New York, through Canada to Northern Michigan and Northern Minnesota.

Genl. Char. Size small; colors dark; beneath gray in winter, tail dark.

Color. Winter Pelage. Dorsal band ferruginous; sides and feet above, olivaceous gray; under parts gray and dusky; tail above ferruginous, fringed with same and with a subapical black band; beneath tawny fringed and banded as on upper surface.

Summer Pelage. Above dull ferruginous, brightest on upper surface of arms and feet; olivaceous on sides and face; black lateral stripe; under parts pure white.

Measurements. Total length, 300; tail vertebræ, 117; hind foot, 47.

b.—loquax. (*Sciurus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 161.

carolinensis, Ord, (nec Gmel). Guthr. Geog., Am. ed. 1818, 11, p. 292.

Type locality. Liberty Hill, New London, Connecticut.

Geogr. Distr. Ontario to North Carolina in the east, and west to Minnesota.

Genl. Char. Larger than *S. hudsonius*; tail longer; dorsal stripe in winter bright red; under parts not vermiculated.

Color. Winter Pelage. Similar to *S. hudsonius*; but dorsal stripe brighter red varying to orange rufous; rest of upper parts more yellowish; under parts grayish white. Black on tail narrower; hairs on central part clear red.

Summer Pelage. Usually brighter and more red; above reddish yellow; feet ochraceous, beneath white.

Measurements. Total length, 286–356; tail vertebræ, 92–146; hind foot, 40–52.

c.—minnesota. (*Sciurus*), Allen, Am. Nat., 1899, xxxiii, p. 640.

Type locality. Fort Snelling, Minnesota.

Geogr. Distr. Southern Minnesota and Wisconsin, Iowa? eastward to Northern Indiana.

Genl. Char. Sizes largest of the eastern Chickarees; hind foot large, colors light.

Color. Above and sides, pale yellow and black, the tips of the hairs being yellow succeeded by a black band which shows among the yellow. A broad light red band from between the ears along the back to end of tail vertebræ; beneath grayish white. Tail light red above, bordered and tipped narrowly with black and fringed with pale yellow; beneath pale yellow, bordered with black and a pale yellow fringe. Forehead reddish; sides of face light gray.

Measurements. Total length, 345–369; tail vertebræ, 137–143; hind foot, 47–50.

d.—dakotensis. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 325.

Type locality. Black Hills, South Dakota.

Geogr. Distr. Black Hills of South Dakota and adjoining parts of Wyoming.

Genl. Char. Size larger than *S. h. loquax*; colors paler.

Color. Winter Pelage. Dorsal line yellowish rufous; rest of upper parts and outside of limbs and feet, yellowish gray; beneath white; tail above like back with narrow black border and fulvous fringe; beneath pale gray in center shading into pale fulvous, bordered and fringed as on upper part.

Summer Pelage. Above yellow olive gray; no lateral line; outside shoulders, feet and edge of thighs, yellowish rufous; beneath pure white; tail above yellowish rufous, bordered and fringed as in winter, beneath grizzled, yellowish in center.

Measurements. Total length, 338-356; tail vertebræ, 143-149; hind foot, 50-52.

e.—baileyi. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1898, p. 261.

Type locality. Big Horn Mountains, Wyoming.

Geogr. Distr. Mountain ranges of Central Wyoming and Eastern Montana, north into Alberta, in eastern foothills of the Rocky Mountains.

Genl. Char. Pale dorsal band, tail narrowly bordered with black, size large.

Color. Summer Pelage. Above yellowish olivaceous; fore legs and feet, edge of thighs and hind feet ochraceous orange; black lateral line; beneath white washed with yellow; tail above cherry red to yellowish red, grizzled, bordered with black and fringed with yellow; lower surface pale yellowish gray grizzled with black, bordered and fringed like upper part.

Measurements. Total length, 313-359; tail vertebræ, 121-145; hind foot, 49-53.

f.—ventorum. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1898, p. 263.

Type locality. South Pass City, Wyoming.

Geogr. Distr. Wind River Mountains north to Mystic Lake, west to head of Snake River in Idaho, south to Wahsatch Range, northeastern Utah.

Genl. Char. Dorsal line and back dark red; apical third of tail black; size large.

Color. Winter Pelage. Upper parts, legs and feet yellowish gray; dorsal line dark rufous; lateral line dusky; beneath white; tail above yellowish rufous bordered with black and fringed with yellow; beneath grizzled gray.

Summer Pelage. Above dark olivaceous, sides of shoulders and edge of thighs reddish fulvous; feet above ochraceous; lateral line obscure; tail like winter but reddish, central area not well defined.

Measurements. Total length, 300-350; tail vertebræ, 121-145; hind foot, 49-55.

g.—richardsoni. (*Sciurus*), Bachm., Proc. Zool. Soc., 1838, p. 100.

Type locality. Columbia River, Oregon.

Geogr. Distr. Western border of northern Montana, central and northern Idaho, northeastern Washington and Oregon, northward into British Columbia.

Genl. Char. Upper surface of tail mostly black; size large.

Color. Winter Pelage. Upper parts, limbs and feet, brownish gray; dorsals and chestnut rufous; tail on basal half dark rufous in center grizzled with black, remainder all black fringed with yellowish for two-thirds the length; black lateral line present; beneath, yellowish gray in center, rest black; under parts white vermiculated with black; ears tipped with black.

Summer Pelage. Above rufous olivaceous; fore arm to shoulder, hind limbs to thighs, and feet ochraceous orange; beneath white; black lateral line conspicuous; tail above deep red for two-thirds the length, rest black with rufous fringe on sides, beneath grizzled gray washed with fulvous.

Measurements. Average total length, 333; tail vertebræ, 125; hind foot, 51.7.

h.—streatori. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., N. Y., 1898, p. 267.

Type locality. Ducks, British Columbia.

Geogr. Distr. Northern Washington from Columbia River to central British Columbia.

Genl. Char. Apical third of tail black; size large.

Color. Winter Pelage. Similar to *S. h. richardsoni*, but tail less black. Dark chestnut dorsal band; beneath grayish white. Tail above four-fifths its length rufous chestnut grizzled with black, with the usual black border and pale yellow fringe; apical portion black; below grizzled gray tinged with pale rufous.

Summer Pelage. More olivaceous, less rufous; lateral line broad and black; black on tail much reduced; yellow fringe broadened.

Measurements. Total length, 280-355; tail vertebræ, 105-144; hind foot, 47-54.

i.—vancouverensis. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 165.

Type locality. Duncan Station, Vancouver Island.

Geogr. Distr. Vancouver Island north to Sitka, Alaska.

Genl. Char. Apical third of tail black. Size small.

Color. Winter Pelage. Above like *S. h. richardsoni*; tail has only the apical third black; under parts gray tinged with brown and vermiculated with dusky. Tail like that of *S. h. streator*.

Summer Pelage. Above dark olivaceous, tinged with reddish in some specimens; under parts white tinged with yellow.

Measurements. Total length, 290-325; tail vertebræ, 103-132; hind foot, 48-52.

79. douglasi. (*Sciurus*), Bachm., Proc. Zool. Soc., 1838, p. 99.

belcheri. Gray, Ann. & Mag. Nat. Hist., 1842, p. 263.

suckleyi. Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 333.

Type locality. "Columbus River," Oregon.

Geogr. Distr. Coast region of Oregon and Washington, from Cape Blanco to Puget Sound.

Genl. Char. Tail fringed with yellowish; beneath in summer, orange.

Color. Winter Pelage. Dark ferruginous dorsal band; rest of upper parts, limbs and feet, dark gray; under parts ochraceous gray vermiculated with black; lateral line present. Tail above two-thirds its length dark ferruginous and black; black border narrow; subterminal black bar broad; fringe of tail yellowish. Tail beneath grizzled rusty, the black margin apical band and yellow fringe more distinct than above.

Summer Pelage. Olivaceous brown tinged with reddish; under parts orange varying in depth; feet orange rufous; lateral line conspicuously black. Tail as in winter pelage, but thinner.

Measurements. Total length, 295-343; tail vertebræ, 113-144; hind foot, 47-51.

α-mollipilosus. (*Sciurus*), Aud. & Bach., Proc. Acad. Nat. Scien. Phil., 1842, p. 102.

orarius, Bangs, Proc. Biol. Soc. Wash., 1897, p. 281.

Type locality. Northern California.

Geogr. Distr. Coast of northern California from Sonoma county, into Curry county, Oregon.

Genl. Char. White tail fringe; size small.

Color. Winter Pelage. Similar to *S. douglasi*, but dorsal band not so dark, and sides more grayish; under parts buffy gray and black. Tail as in *S. douglasi*, but fringed with white instead of yellow.

Summer Pelage. Like *S. douglasi*, but tail fringed with white. Above more olivaceous.

Measurements. Total length, 314-347; tail vertebræ, 121-148; hind foot, 45-55.

b-cascadensis. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist. N. Y., 1898, p. 277.

Type locality. Mt. Hood, Oregon.

Geogr. Distr. Cascade Mountains of Oregon and Washington, north into British Columbia. Also coast region from Fraser River to Rivers Inlet north of Vancouver Island.

Genl. Char. White fringed tail; size larger than *S. d. mollipilosus*.

Color. Summer Pelage. More olivaceous above and less deeply orange below than either *S. d. mollipilosus* or *S. douglasi*, varying from yellowish buff to buffy ochraceous (Allen l. c.).

Measurements. Total length, 270-348; tail vertebræ, 102-146; hind foot, 48-52.

c-albolimbatus. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1898, p. 453.

californicus, Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 165. (Pre-occupied).

Type locality. Sierra Nevada of northern California?

Geogr. Distr. Sierra Nevada region of northern California and Oregon east of Cascades to the Maury Mountains, and Strawberry Butte.

Genl. Char. Tail fringe white; under parts in summer pale buff.

Color. Winter Pelage. Upper parts like *S. d. cascadensis*, dorsal band paler chestnut and general color lighter grayish. Outer fringe on tail broader. Under parts grayish white.

Summer Pelage. Above like *S. d. cascadensis*; ventral surface pale fulvous; feet, and line on edge of thigh, deep ochraceous.

Measurements. Total length, 290-348; tail vertebræ, 116-156; hind foot, 47-55.

80. fremonti. (*Sciurus*), Aud. & Bach. Quad. N. Am., 1853, III, p. 237.

Type locality. South Pass, Rocky Mountains?

Geogr. Distr. Mountains of Colorado and Uintah Mountains, Utah, to the southern border of Wyoming.

Genl. Char. Dorsal band, pale yellowish rufous.

Color. Winter Pelage. Above gray; dorsal band pale yellowish rufous; obscure dusky lateral line; under parts grayish white. Tail yellowish rusty above, bordered with black and fringed with white; beneath pale fulvous gray, bordered and fringed as above.

Summer Pelage. Above yellowish gray; fore arm and upper surface of feet ochraceous; lateral line black; beneath grayish white; tail as in winter, but thinner.

Measurements. Total length, 303-345; tail vertebræ, 102-145; hind foot, 47-52.

a—mogollensis. (*Sciurus*), Mearns, Bull. Am. Mus. Nat. Hist., 1887-90, p. 277.

Type locality. Quaking Asp Settlement, central Arizona.

Geogr. Distr. Higher mountains and plateaus of central Arizona.

Genl. Char. Dorsal band brighter yellowish rufous than in *S. fremonti*.

Winter Pelage. Like *S. fremonti*, but the dorsal band is a brighter, deeper tint of yellowish rufous.

Summer Pelage. Like *S. fremonti*, but upper parts brighter rufous.

Measurements. Total length, 310-365; tail vertebræ, 126-158; hind foot, 49-56.

b—neomexicanus. (*Sciurus*), Allen, Bull. Am. Mus. Nat. Hist., 1898, p. 291.

Type locality. Rayado Cañon, Colfax county, New Mexico.

Geogr. Distr. Taos Range, New Mexico.

Genl. Char. Similar to *S. f. mogollensis*, but smaller.

Color. Winter Pelage. "Similar to *S. fremonti*, but dorsal band much brighter yellowish rufous, nearly as in *S. f. mogollensis*."

Measurements. Total length, 308-330; tail vertebræ, 127-145; hind foot, 45-52 (Allen l. c.).

c—grahamensis. (*Sciurus*). Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 350.

Type locality. Graham Mountains, Arizona.

Geogr. Distr. Graham Mountains, southeastern Arizona.

Genl. Char. Like *S. f. mogollensis*, but paler.

Color. Summer Pelage. More yellow above than *S. f. mogollensis*, with tail above ochraceous, and nearly white beneath.

Measurements. Total length, 325-340; tail vertebræ, 130-140; hind foot, 50-57.

37. *Tamias*.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{1-1}, \text{ or } \frac{1-1}{1-1}; M. \frac{3-3}{3-3}; = 20 \text{ or } 22.$$

J. A. Allen. *A review of some of the North American ground squirrels.* Bull. Am. Mus. Nat. Hist., 1890, p. 45.

C. H. Merriam. *Notes on the Chipmunks of the Genus Eutamias, occurring west of the east base of the Cascade Sierra system, with description of new forms.* Proc. Biol. Soc. of Wash., 1897, p. 189.

Tamias. Ill. Syst. Mamm., 1811, p. 830. Type *Sciurus striatus*, Linn.

Tenotis, Rafn. Am. Month. Mag., 1817, 1, p. 362.

Eutamias, Trouess. Le Nat., 1880, p. 86.

Tail short, not bushy, narrow, cheek pouches large; ears medium without tufts. Skull narrow anteriorly, superior outline convex, postorbital processes slender, directed backward and downward; anteorbital foramen oval; zygomata expanded and depressed anteriorly; upper premolars either two or one.

A. *Eutamias*.

Skull with superior outline highest over parietals; orbital foramen a narrow, oval, slit-like opening; rostrum compressed; nasals short, narrowing only slightly posteriorly; pterygoid fossa long and wider; audital bullæ large.

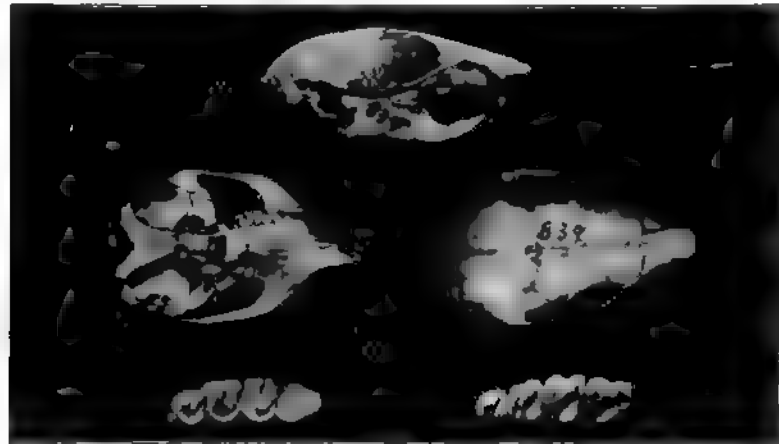


FIG. 16. TAMIAS (EUTAMIAS) DORSALIS.

No. 839 Field Columbian Museum Coll.

UPPER TOOTH ROW.
Enlarged 4 times.

LOWER TOOTH ROW
Enlarged 4 times.

81. dorsalis. (*Tamias*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 332.

quadristatus pallidus, Coles & Yarr. in Wheeler's Rep. Geogr. Expl. & Surv. West of 100 Merid., 1876, v, p. 118.

Type locality. Fort Webster, New Mexico.

Geogr. Distr. Northern Utah to Mexico; west to Sierra Nevada Mountains; east to the Mimbres in New Mexico.

Genl. Char. Single dorsal stripe alone conspicuous.

Color. Upper parts hoary mixed with rusty and brown; flanks

and hips dull rusty; dorsal stripe dark brown; a faint stripe of grayish on flanks. Under parts dull grayish white. Tail above mixed black, chestnut and white; hairs chestnut at base. Face with usual *Tamias* stripes.

Measurements. Total length, 237; tail vertebræ, 105; hind foot, 22; ear, 20.

a. -- utahensis. (*Eutamias*), Merr., Proc. Biol. Soc. Wash., 1897, p. 210.

Type locality. Ogden, Utah.

Geogr. Distr. Northern Utah and northwestern Nevada through Arizona to New Mexico.

Genl. Char. Similar to, but smaller and paler than *T. dorsalis*; markings less distinct; tail below fulvous; not rufous.

Color. Winter Pelage. Above hoary buff; top of head dark; median dorsal stripe noticeable, others nearly obsolete; sides pale fulvous; post-auricular patch light buff; facial stripes pale. Tail below fulvous, bordered with black fringed with yellowish.

Measurements. Average total length, 223.6; tail vertebræ, 102; hind foot, 32.9.

82. palmeri. (*Eutamias*), Merr., Proc. Biol. Soc. Wash., 1897, p. 208.

Type locality. Charleston Peak, Nevada.

Geogr. Distr. Restricted to type locality.

Genl. Char. Resembles *T. dorsalis* in winter pelage; dorsal stripes short.

Color. Winter Pelage. Above gray; flanks pale fulvous; light stripes hoary gray, outer ones whitish; dark dorsal stripes pale ferruginous; middle one blackish; facial stripes faint; feet grayish fulvous. Tail above grayish at base, remainder black, tips of hairs on base and sides yellowish; beneath rufous bordered with black, fringed on sides with yellowish.

Measurements. Average total length, 219.3; tail vertebræ, 93.4; hind foot, 33.3.

83. townsendi. (*Tamias*), Bachm., Jour. Acad. Nat. Scien. Phil., 1839, p. 68.

cooperi. Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 334.

Type locality. Mouth of Columbia River.

Geogr. Distr. Coast region of Oregon, Washington and British Columbia, from mouth of Columbia River northward; east in northern Cascades to head of Lake Chelan.

Genl. Char. Yellowish brown or olivaceous rufous above; size large, tail very long, equal to three-fourths the length of head and body, ears large.

Color. Post-breeding Pelage. General color olivaceous rufous with a yellow tinge; flanks deeper. Black dorsal stripes five; outer ones shortest; outer pair of light stripes, gray. Facial markings of usual pattern. Ears blackish, grayish spot behind base of ear. Ventral surface grayish white. Tail above black fringed with white; beneath bright chestnut, bordered with black and fringed with white.

Breeding Pelage. Tints paler, lightest dorsal stripes, gray.

Measurements. Total length, 257; tail vertebræ, 107; hind foot, 35.

a.—hindsii. (*Tamias*), Gray, Ann. & Mag. Nat. Hist., 1842, p. 264.

Type locality. Nicasio? California.

Geogr. Distr. Coast of California from San Francisco north.

Genl. Char. Similar to *S. townsendi*, but much darker; lightest dorsal stripes whitish; post-auricular patch conspicuous.

Color. Post-breeding Pelage. Above cinnamon rufous; median pair of light stripes like ground color, outer pair whitish; ventral surface white washed with buff.

Breeding Pelage. Above dark reddish brown, mixed with gray; brighter red on flanks, darker gray on rump, thighs and shoulders. Dark dorsal stripes five, outer pair usually hardly traceable; median stripe edged with chestnut rufous; median pair of light stripes mixed rufous and gray; outer pair whitish; facial stripes strongly contrasted. Ear dusky brown anteriorly, silvery gray posteriorly. Post auricular patch small, pale gray. Ventral surface white. Tail above blackish, beneath reddish chestnut, bordered with black and fringed with white.

Measurements. Total length, 264; tail vertebræ, 110; hind foot, 34; ear, 11.

b.—pricei. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 333.

Type locality. Portola, San Mateo county, California.

Geogr. Distr. Coast region of California from Mountains of San Diego and San Bernardino county north to San Francisco.

Genl. Char. Intermediate in size and color between *T. hindsii* and *T. merriami*.

Color. Breeding Pelage. Above grayish brown, varied with hazel. Flanks tawny; dorsal stripes—five hazel and black, four ashy-gray. Shoulders and thighs grayish; under parts whitish. Light facial stripes gray; dark ones hazel brown; post-auricular patches small, grayish white. Tail, above mixed clay color, and black and grayish; beneath dark reddish chestnut bordered with black and fringed with gray.

Measurements. Average total length, 252; tail vertebræ, 119; hind foot, 35.

e.—ochrogenys. (*Eutamias*), Merr., Proc. Biol. Soc. Wash., 1897, p. 206.

Type locality. Mendocino, California.

Geogr. Distr. Cazadero, north of San Francisco Bay, California, to the mouth of Rogue River, Oregon.

Genl. Char. Size large; colors dark; similar to *T. merriami*, but darker.

Color. Winter Pelage. Upper parts grizzled olive; sides fulvous; dark dorsal stripes, black; light ones grayish; sides of face ochraceous. Tail, above black and hoary; below chestnut, bordered with black.

Post-breeding Pelage. Above fulvous, paler on rump; only the median dorsal band clear black, others reddish; inner light stripes tinged with fulvous, outer grayish; under parts washed with fulvous.

Measurements. Total length, 261; tail vertebræ, 113; hind foot, 38.

84. merriami. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 84.

Type locality. San Bernardino Mountains, California.

Geogr. Distr. Mountains of Southern California from San Diego county north to Tulare and Monterey counties.

Genl. Char. Size large; color pale; facial and dorsal marking not strongly contrasted; ears high, pointed.

Color. Above dull yellowish gray mixed in places with fulvous; dorsal streaks pale yellowish to fulvous brown; the light ones pale gray; sides and rump pale olivaceous. Tail, above blackish fringed with gray; beneath reddish chestnut, bordered with black and fringed with whitish.

Post-breeding Pelage. Flanks golden rufous; dark dorsal streaks yellowish rufous; light ones silver gray. Tail, below orange chestnut; above orange yellow.

Measurements. Average total length, 285; tail vertebræ, 117; hind foot, 34.

85. quadrimaculatus. (*Tamias*), Gray, Ann. & Mag. Nat. Hist., 1867, p. 435.

macrorhabdotes, Merr., Proc. Biol. Soc. Wash., 1884, p. 25, fig. p. 26.

Type locality. Michigan Bluff, Sacramento Valley, California.

Geogr. Distr. Central California, in the Sierra Nevada, Placer county, to Fort Klamath, Oregon, through the valley of the Sacramento River.

Genl. Char. Ears very large, post-auricular patches very large.

Color. Post-breeding Pelage. Head and rump gray; rest of body ferruginous, under parts white, sometimes tinged with fulvous. Five dark dorsal stripes black, those on either side next the center one edged with rufous; median light stripes gray, outer ones white. Dark facial streaks rusty brown; light streaks fulvous white; ears blackish edged with rusty and bordered posteriorly with white. Post-auricular patches large, white. Tail, above blackish fringed with white; beneath orange rufous, bordered with black and fringed with white.

Autumn Pelage. Like the above except the whole half of the posterior dorsal region is gray; anterior half rufous; flanks deeper rufous, ears more reddish.

Measurements. Total length, 249; tail vertebræ, 93; hind foot, 305.

86. senex. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 83.

Type locality. Summit of Donner Pass, Placer county, California.

Geogr. Distr. Sierra Cascade Mountains from Farewell Bend on the Des Chutes River in Oregon, south to the head waters of the Merced River in Yosemite National Park.

Genl. Char. All upper parts gray; ears small.

Color. Breeding Pelage. Above gray; yellowish tinge on sides of neck and shoulders; flanks yellowish brown; dark dorsal stripes black to rusty brown, light stripes pale gray. Ventral surface dull white. Facial stripes rusty brown and grayish white. Tail, above blackish; below pale orange, edged with black, hairs tipped with white.

Measurements. Total length, 263; tail to end of hairs, 114; hind feet, 35.

87. speciosus. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 86.

Type locality. San Bernardino Mountains, California.

Geogr. Distr. San Bernardino and San Jacinto Mountains, California.

Genl. Char. Size medium or small. Similar to *T. merriami*; tip of tail above and below, black.

Color. Post-breeding Pelage. Dark dorsal stripes dark brown suffused with ferruginous; outer light stripe pure white; sides ferruginous; post-auricular patches very large, white; facial stripes distinct; dark ones dusky, obscured with rusty; light ones white. Tail, bright chestnut above obscured with black, edged with yellowish; beneath chestnut with lateral border and terminal fourth black, fringe yellowish.

Breeding Pelage. Above yellowish gray with two broad white

stripes. Ferruginous color has nearly disappeared from the dark dorsal stripes and flanks, the latter suffused with pale yellowish brown.

Measurements. Total length, 234; tail vertebræ, 91; hind foot, 32.

88. callipeplus. (*Tamias*), Merr., Proc. Biol. Soc. Wash., 1893, p. 136.

Type locality. Mount Pinos, Ventura county, California.

Geogr. Distr. Mount Pinos and head waters of Yule River, north nearly to the Yosemite Valley.

Genl. Char. Similar to *T. speciosus*, but thighs and rump yellowish instead of gray, and inner pair of light dorsal stripes vinaceous drab instead of gray.

Color. Winter Pelage. Top of head, nape and inner pair of light dorsal stripes vinaceous drab, shoulders ochraceous, flanks fulvous, thighs and rump yellowish; central dorsal stripe dark umber brown edged with rusty, inner pair dark ferruginous, outer pair fulvous; post-auricular patches large, white; facial stripes dark; tail orange rufous bordered with black and fringed with yellow; under parts pure white.

Measurements. Total length, 212; tail vertebræ, 91.7; hind foot, 34.

a.—inyoensis. (*Eutamias*), Merr., Proc. Biol. Soc. Wash., 1897, p. 208.

Type locality. White Mountains, Inyo County, California.

Geog. Distr. Summits of White and Inyo Mountains, California.

Genl. Char. Similar to *T. speciosus*, but rump grizzled golden yellow.

Color. Top of head grizzled grayish; dark dorsal stripe black and rusty; outer pair light stripes white; sides bright fulvous; back and sides of neck grayish white; rump golden yellow and black; feet fulvous. Tail, above yellow ochraceous and black; below fulvous bordered with black.

Measurements. Average total length, 229; tail vertebræ, 100; hind foot, 33.3.

89. frater. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 88.

Type locality. Sierra Nevada Mountains, Placer county, California.

Geogr. Distr. Western Nevada to central California and region of Lake Tahoe.

Genl. Char. Size large; post-auricular patches large, white; tail deep orange.

Color. Breeding Pelage. Above pale gray, darker on lower

back and thighs; flanks rusty brown; middle dorsal stripes blackish edged with rufous; outer ones light rufous; light stripes, median pair ashy, outer white. Dark facial stripes black or rusty brown; light ones grayish white or white. Tail, above rusty orange mixed with black; beneath orange bordered and tipped with black, and fringed with pale yellow.

Measurements. Average total length, 233; tail to end of hairs, 97.5; hind foot, 32.

90. panamintinus. (*Tamias*), Merr., Proc. Biol. Soc. Wash., 1893, p. 134.

Type locality. Johnson Cañon, Panamint Mountains, California.

Geogr. Distr. West side of Great Basin in California and Nevada.

Genl. Char. Similar to *T. speciosus* of Lower California, but paler; hind foot very short.

Color. Winter Pelage. Top of head and rump ash gray; dark dorsal stripes dull fulvous; inner pair of light stripes vinaceous drab, outer pair dull white; sides gray tinged with buffy ochraceous. Facial stripes indistinct. Tail, above orange rufous bordered with black and fringed with yellowish; beneath similar, the orange rufous deeper.

Measurements. Type. Total length, 208; tail vertebræ, 96; hind foot, 31.

91. amoenus. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 90.

Type locality. Fort Klamath, Oregon.

Geogr. Distr. Fort Klamath, Oregon, to Placer county, California, and western Nevada about Lake Tahoe.

Genl. Char. Similar to *T. frater*, but smaller, colors paler.

Color. Spring Pelage. Above vinaceous gray; flanks ochraceous brown; dark dorsal streaks seal brown edged with rufous; others chestnut; light stripes, pale gray; outermost ones white. Ventral surface white sometimes tinged with yellow. Tail above black and ochraceous; beneath pale orange yellow, edged and tipped with black, tips of hairs ochraceous yellow.

Breeding Pelage. Colors much paler; vinaceous of upper parts gone; the stripes are yellowish; flanks pale rufous; tail above pale buff.

Measurements. Total length, 207; tail vertebræ, 70; hind foot, 30.

92. caurinus. (*Tamias*), Merr., Proc. Acad. Nat. Scien. Phil., 1898, p. 352.

Type locality. Solduck Trail, Olympic Mountains, Washington.

Geogr. Distr. Olympic Mountains, Washington, timber line.

Genl. Char. Similar to *T. amœnus*, hind feet longer.

Color. Post-breeding Pelage. As compared with *T. amœnus*, post-auricular patches obsolete; back of neck and shoulders grizzled with fulvous, not hoary; dorsal stripes mixed with fulvous; tail beneath black, border broader, and the central portion mixed with black.

Measurements. Total length, 210; tail vertebræ, 85; hind foot, 34.

93. cinereicollis. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 94.

Type locality. San Francisco Mountains, Arizona.

Geogr. Distr. San Francisco and Mogollon Mountains, Arizona.

Genl. Char. Allied to *T. umbrinus*, but neck and shoulder differently colored from the flanks.

Color. Autumn Pelage. Above gray; flanks yellowish brown; thighs and rump pale yellowish brown; dark dorsal stripes black edged with chestnut brown; inner pair of light stripes whitish gray; outer pair white. Light facial stripes white; dark ones rusty brown. Under part of body white. Post-auricular patch light gray. Tail above blackish; beneath orange rufous, bordered with black and fringed with buff.

Breeding Pelage. Colors much faded; sides faintly washed with pale yellowish brown or pale buff. Upper parts dull yellowish gray.

Measurements. Average total length, 247; tail vertebræ, 102; hind foot, 35.

94. umbrinus. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 96.

Type locality. Uintah Mountains, Utah, south of Fort Bridger.

Geogr. Distr. Wahsatch and Uintah Ranges of northern and central Utah.

Genl. Char. Larger than *T. quadrivittatus*, colors duller, and outer dark stripe obsolete.

Color. Autumn Pelage. Above yellowish brown gray; flanks dull yellowish brown; under parts grayish white. Dark dorsal stripes black mixed with yellowish or rusty brown; outer ones usually obsolete. Light stripes pale gray, outer ones whitish. Facial streaks dusky brown and gray. Tail above orange and black; beneath orange rufous bordered with black and fringed with yellowish.

Measurements. Total length, 249; tail vertebræ, 100; hind foot, 32.

95. quadrivittatus. (*Sciurus*), Say, Long's Exped. Rocky Mts., 11, 1823, p. 45.

Type locality. Rocky Mountains about the sources of the Arkansas and Platte Rivers.

Geogr. Distr. Southern boundary of Colorado northward through Wyoming, including the Yellowstone National Park.

Genl. Char. Rather small, general color gray.

Color. Breeding Pelage. Above gray, sides washed with pale yellowish brown, beneath grayish white. Dark dorsal stripes black and rufous; light ones ashy, outer white.

Post-breeding Pelage. Above rufous, thighs plumbeous gray; dark dorsal stripes black and rufous; outer light stripes whitish; flanks yellowish rufous; broader parts grayish white. Dark facial stripes rusty brown; light ones grayish white. Tail above black and buff; beneath buffy ochraceous bordered and fringed with black.

Measurements. Average total length, 223; tail vertebræ, 82; hind foot, 31.

a.—gracilis. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 99.

Type locality. San Pedro, New Mexico.

Geogr. Distr. Sycorro County, New Mexico, to Apache County, Arizona.

Genl. Char. Larger than *T. quadrivittatus*, but more slender; tail longer, ears larger and color very different.

Color. Post-breeding Pelage. Above light gray; post-auricular patches whitish gray. Dark dorsal stripes black; outer part nearly obsolete; light stripes whitish gray, outer pair white. Dark facial streaks bright rusty. Thighs and rump gray. Tail above black and rusty, below deep orange rufous bordered with black and fringed with buff.

Measurements. Total length, 245; tail to end of hairs, 120; hind foot, 34.

b.—luteiventris. (*Tamias*), Allen, Am. Mus. Nat. Hist., 1890, p. 101.

Type locality. Chief Mountain Lake, Montana.

Geogr. Distr. Rocky Mountains in Montana from Helena northward, probably into British America.

Genl. Char. Similar to *T. borealis*, but colors much brighter; body beneath buffy.

Color. Post-breeding Pelage. Above gray mixed with rufous; flanks ferruginous; ventral surface buff. Dark dorsal stripes black edged with rufous. Light stripes gray and vinaceous; outer pair white. Tail, above black and buff, beneath pale orange bordered with black, and fringed with pale yellow. Upper surface of feet orange buff.

Measurements. Average total length, 243; tail vertebræ, 92; hind foot, 32.

c.—felix. (*Tamias*), Rhoads, Amer. Natur., 1895, p. 941.

Type locality. Mt. Baker Range, Westminster District, British Columbia.

Geogr. Distr. Mt. Baker Range, British Columbia, extent unknown.

Genl. Char. Darker than *T. quadrivittatus*, or *T. luteiventris*, more nearly resembling the latter.

Color. Colors and pattern as in *T. quadrivittatus*, but darker. From *T. luteiventris* it differs in a deeper orange on cheeks, sides and tail; head, shoulders, neck and upper part of back rusty brown; dorsal black stripes broad; light stripes rusty; upper parts not hoary.

Measurements. Total length, 245; tail vertebræ, 105; hind foot, 32.5.

d.—affinis. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 103.

Type locality. Ashcroft, British Columbia.

Geogr. Distr. Interior of British Columbia, east of the Cascade Mountains.

Genl. Char. Similar to *T. quadrivittatus*, but larger.

Color. Spring Pelage. Above yellowish gray brown; sides brownish ochre; beneath grayish white, tinged with fulvous. Dark dorsal stripes black, light ones gray mixed with rufous; outer ones yellowish white. Dark facial stripes rusty brown and black, light ones brownish white. Tail, above black and pale ochraceous; beneath orange rufous bordered with black and fringed with pale ochraceous.

Breeding Pelage. Above ashy gray, sides tinged with yellowish; tail thin, below pale yellowish rufous, yellow fringe mostly worn away.

Post-breeding Pelage. Gray suffused with yellowish rufous; thighs and rump ash gray; flanks deep ochre. Facial and dorsal stripes like spring phase.

Measurements. Average total length, 125; tail to end of hairs, 120; hind foot, 31.5.

e.—borealis. (*Tamias*), Allen, Mon. N. Am. Rodent., 1877, p. 793 (Part).

Type locality. Fort Liard, British America.

Geogr. Distr. Northern North America, Hudson Bay to eastern base of Rocky Mountains, also in North and South Dakota and Montana.

Genl. Char. Smaller than *T. quadrivittatus*, more yellow on sides, and on light dorsal streaks.

Color. Autumn Pelage. Above pale yellowish gray; dark dorsal streaks black; light ones gray; outer one white tinged with yellowish; sides washed with yellowish brown; thighs and rump yellowish gray; ventral surface grayish white tinged sometimes with buff.

Dark facial stripes blackish mixed with rusty brown. Tail, below pale orange, bordered with black and fringed with yellowish.

Breeding Pelage. Above ash gray tinged with yellowish; sides pale yellowish; dark dorsal stripes with less rufous, median light ones ashy, outer ones white.

Measurements. Average total length, 206; tail to end of hairs, 92; hind foot, 32.

f.—neglectus. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1891, p. 106.

Type locality. Eastern end of Lake Superior, mouth of Montreal River.

Geogr. Distr. Northeastern Minnesota, northern Wisconsin, northern peninsula of Michigan, and northern shore of Lake Superior.

Genl. Char. Similar to *T. borealis*, but colors much brighter; size larger.

Color. Post-breeding Pelage. Above gray; sides redder than in *T. borealis*, and less gray on rump and thighs; lower lateral dark stripe blacker.

Measurements. Total length, 204; tail vertebræ, 97; hind foot, 31.

96. minimis. (*Tamias*), Bachm., Jour. Acad. Nat. Scien. Phil., 1839, p. 71.

Type locality. Green River, southwestern Wyoming.

Geogr. Distr. Bad Lands and plains of Dakota, Montana, and Wyoming.

Genl. Char. Colors pale; size small; ears medium.

Color. Post-breeding Pelage. Above light gray and rusty, except on thighs and rump; sides ochraceous buff; under parts grayish white. Median dorsal stripe edged with rusty; others pale rusty yellow and black; central light stripes whitish gray, outer ones white. Indistinct grayish white post-auricular patch. Tail, above blackish, below ochraceous bordered with black, fringed with ochraceous.

Breeding Pelage. Similar to above, but all colors much faded. Upper parts pale yellowish white; dark streak yellowish brown. Tail, beneath pale yellowish white.

Measurements. Average total length, 200; tail vertebræ, 85; hind foot, 29.

a.—consobrinus. (*Tamias*), Allen, Mon. N. Am. Rodent., 1887, p. 793 (Part).

Type locality. Wahsatch foothills near Salt Lake City, Utah.

Geogr. Distr. Eastern border of the Great Basin, eastern Utah, western and southern Colorado, and northwestern New Mexico.

Genl. Char. Larger than *T. minimus*, and colors darker.

Color. Breeding Pelage. Above gray mixed with rufous and black; flanks faintly washed with pale buff; under parts grayish white. Dark dorsal stripes black, black and rusty, and rusty yellowish, chestnut brown on outer pair. Light stripes pale gray, outer ones white. Light facial stripes grayish white, dark ones pale dusky brown. Tail above black and yellowish white; below deep buff bordered with black and fringed with yellowish white. Post-auricular patches small, yellowish white.

Post-breeding Pelage. Above gray, rusty and black; flanks yellowish brown, under parts white tinged with buff. Median dorsal stripe black edged with rusty, rest seal brown and rusty; median light ones gray and rusty yellow, outer pair white tinged with yellow.

Measurements. Total length, 203; tail vertebræ, 90; tail to end of hairs, 103.

b.—melanurus. (*Tamias*), Merr., N. Am. Faun., No. 4, 1890, p. 22.

Type locality. Blackfoot Idaho.

Geogr. Distr. Known only from type locality.

Genl. Char. Similar to *T. m. consobrinus*; tail beneath black.

Color. Like *T. m. consobrinus*, but tail beneath black bordered with pale yellowish.

Measurements. Tail vertebræ, 84; hind foot, 29.

c.—pictus. (*Tamias*), Allen, Bull. Am. Mus. Nat. Hist., 1890, p. 115.

Type locality. Kelton, Utah.

Geogr. Distr. Western border of Great Salt Lake westward, and from southern Utah and southern Nevada to the Snake Plains of eastern Washington.

Genl. Char. Similar to *T. minimus*; colors pallid.

Colors. Post-breeding Pelage. Above slate gray; flanks pale yellowish buff; shoulders and hips pale slate gray. Median dark dorsal streaks black; others seal brown edged with rufous; median light stripes slate gray, outer pair white. Tail above black and yellowish gray; below dark yellowish buff, bordered with black and fringed with yellowish gray.

Measurements. Total length, 219; tail vertebræ, 89; hind foot, 29.

d.—alpinus. (*Tamias*), Merr., Proc. Biol. Soc. Wash., 1893, p. 137.

Type locality. Big Cottonwood Meadows, high Sierras, California, south of Mt. Whitney.

Geogr. Distr. Alpine summit of high Sierras, California.

Genl. Char. Similar to *T. m. pictus*, but paler; tail broader and more hoary above, black tipped above and below.

Color. Autumn Pelage. Above hoary gray; flanks buffy och-

raceous ; central dorsal stripe dusky ; lateral one pale ferruginous ; inner pair of light stripes hoary gray, outer white ; post-auricular patches illy defined ; fascial stripes pale ; feet and legs gray. Tail above hoary, black towards the tip ; beneath pale buffy fulvous ; bordered with black and fringed broadly with pale buff.

Summer Pelage. Dorsal stripes bright ferruginous ; fascial stripes dull rusty ; flanks, shoulders and neck bright fulvous.

Measurements. Type. Total length, 189 ; tail vertebræ, 82 ; hind foot, 29 ; ear from notch, 13.

97. oreocetes. (*Eutamias*), Merr., Proc. Biol. Soc. Wash., 1897, p. 207.

Type locality. Timber line near Summit, Teton Mountains, Montana.

Geogr. Distr. Only known from type locality.

Genl. Char. Similar in spring to *T. minimus* and *T. m. alpinus* ; dorsal stripes long.

Color. Upper parts gray tinged with yellowish on flanks and sides of neck ; crown grizzled gray ; lateral dark stripes tinged with rusty ; pale stripes whitish ; outer ones white. Tail above grizzled yellowish ; beneath pale fulvous bordered with black and fringed with ochraceous.

Measurements. Total length, 193 ; tail vertebræ, 90 ; hind foot, 31.

98. striatus. (*Sciurus*), Linn. Syst. Nat., 1, 1758, p. 64 (nec. Pall).

americanus, Gmel. Syst. Nat., 1788, 1, p. 150.

Type locality. Virginia?

Geogr. Distr. Southern New York through Atlantic States to Georgia.

Genl. Char. Premolars $\frac{1-1}{1-1}$; tail about three-fifths length of body ; body stout.

Color. Spring Pelage. Above dark chestnut brown ; flanks and limbs pale yellowish brown ; under parts pure white. Dark dorsal stripes black bordered with chestnut brown ; light stripes whitish ; post-auricular patch white. Tail, above grayish white and black ; beneath yellowish brown, bordered with black and fringed with grayish white.

Measurements. Total length, 219-241 ; tail vertebræ, 80-86 ; hind foot, 32-34.

a.—lysteri. (*Sciurus*), Rich., Faun. Bor. Am., 1829, 1, p. 181, pl. 15.

Type locality. "Penetanguishene," Georgian Bay, Ontario, Canada.

Geogr. Distr. North latitude 50° in eastern North America south to northern New York, west to Michigan, and Ontario, Canada.

Genl. Char. Similar to *T. striatus*, but rump and thighs bright red.

Color. Top of head yellowish brown; shoulders and upper parts of back yellowish gray, grading into reddish on lower back; rump and thighs bright red; flanks and sides of thighs pale yellowish; under parts white. Two black dorsal stripes, two yellowish white. Tail, above red at base, then black and gray mixed fringed with yellowish white; beneath reddish brown bordered with black and fringed with yellowish white.

Measurements. Total length, 254; tail vertebræ, 76; hind foot, 35.

b.—griseus. (*Tamias*), Mearns, Bull. Am. Mus. Nat. Hist., 1891, p. 231.

Type locality. Fort Snelling, Minnesota.

Geogr. Distr. Upper Mississippi Valley, west of Great Lakes.

Genl. Char. Large, stout; black markings pronounced; other colors subdued.

Color. Spring Pelage. Above gray and black; forehead chestnut; lower back and rump ferruginous. Cheeks, flanks, and thighs pale yellowish; under parts white. Dorsal stripes black, white one on either side, between two outer black ones. Tail, above ferruginous at base, rest mixed black and white; beneath fulvous bordered with black and fringed with white.

Measurements. Average total length, 261; tail vertebræ, 103; hind foot, 36.3.

c.—venustus. (*Tamias*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 137.

Type locality. Stillwell, Indian Territory.

Geogr. Distr. Known only from type locality.

Genl. Char. Size equal to *T. griseus*; colors bright; dorsal bands short.

Color. Upper surface dark gray; limbs chestnut rufous; flanks yellowish gray; under parts yellowish white. Dorsal stripes black, light ones yellowish white; face suffused with chestnut rufous; facial stripes inconspicuous. Tail, above mixed black and white, beneath cinnamon rufous bordered with black and fringed with whitish.

Measurements. Total length, 260; tail vertebræ, 100; hind foot, 37.

38. *Spermophilus*.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{1-1}; M. \frac{3-3}{3-3} = 22.$$

Spermophilus. F. Cuv. Mém. Mus., 1822, vi, p. 293. Type. *Mus citillus*, Linn.

Spermatophilus. Wagl. Syst. Amph., 1830, p. 22.

Citillus. Lichten. Darst. neuer oder wenig bekannt. Säugeth., 1827-34, pl. xxxi, fig. 2.

Colobotis. Brandt, Bull. Classe Phys—math. Acad. Imp. Scien. St. Petersb., 1844, 11, p. 360.

Otospermophilus. Brandt, Bull. Classe Phys-math. Acad. Imp. Scien. St. Petersb., 1884, 11, p. 379.

Otocolobus. Brandt, Bull. Classe Phys-math. Acad. Imp. Scien. St. Petersb., 1844, 11, p. 382.

Ictidomys. Allen, Mon. Rod., 1877, p. 826.

Ammospermophilus. Merr., Proc. Biol. Soc. Wash., 1892, p. 27.

Xerospermophilus. Merr., Proc. Biol. Soc. Wash., 1892, p. 27.

Callospermophilus. Merr., Proc. Biol. Soc. Wash., 1897, p. 189 (note).

Body rather slender; tail either long, moderate, or short, varying greatly in its length among the different species; ears large to rudimentary, not tufted; cheek pouches large; skull variable, short and broad like *Sciurus*, or long and narrow; postorbital processes strong with a downward direction; anteorbital foramen circular, with a well developed tubercle on outer lower border.

A. *Callospermophilus*.

Size large. Skull broad; interorbital space broad; nasals broad longer than premaxillaries; first premolar small. Tail less than half the length of head and body.



FIG. 17. SPERMOPHILUS (CALLOSPERMOPHILUS) LATERALIS.

No. 2585 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 4 times.

UPPER TOOTH ROW.
Enlarged 4 times.

99. *lateralis*. (*Sciurus*), Say, Long's Exped. Rocky Mts., 1822, 11, p. 46.

Type locality. Arkansas River, Colorado, near Canon City.

Geogr. Distr. Colorado, Utah (Uintah Mts.), and Arizona, (White and San Francisco Mts.).

Genl. Char. Inner black stripe smaller than outer; back grizzled brown.

Color. Above grizzled yellowish brown, gray and black; top of head chestnut; rump and hind part of thighs chestnut brown, mottled with black and yellow; two black stripes enclosing a white one on each side of body; under parts generally pale brownish gray. Tail below bright chestnut, bordered with black and fringed with yellow, above blackish edged with yellow.

Measurements. Total length, 300; tail vertebræ, 93; hind part, 43; ear 29.

a.—*saturatus*. (*Tamias*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1895, p. 43.

Type locality. Lake Kichelos, Kittitas county, Washington.

Geogr. Distr. Central Washington, limits of range unknown.

Genl. Char. Size large; tail very long, colors dark.

Color. Head, sides of neck and fore legs chestnut shaded with black; upper parts, flanks and hind legs, grizzled rusty black. Dark stripes on back black, light stripe white; throat, breast, sides of belly and thighs rusty; chest and belly grizzled black; feet pale rusty. Tail above like back on basal third, rest margined with a black band broadening at tip; tips of hairs rusty, beneath reddish yellow bordered with black.

Measurements. Total length, 317; tail vertebræ, 114; hind foot, 46.

100. *cinerascens*. (*Tamias*), Merr., N. Am. Faun., No. 4, 1890, p. 20.

Type locality. Helena, Montana.

Geogr. Distr. Montana, Idaho and northward into Alberta, British America.

Genl. Char. Inner black stripe smaller than outer; general color grizzled ash gray.

Color. Above clear ash gray grizzled with black; head and neck to shoulders chestnut; black and white stripes both broad and long; outside of thighs reddish brown; under parts yellowish white, dusky bases of hairs perceptible. Tail above mixed black and gray fringed with yellowish; below grayish yellow bordered with black.

Measurements. Total length, 322; tail vertebræ, 108; hind foot, 44.

101. castanurus. (*Tamias*), Merr., N. Am. Faun., No. 4, 1890, p. 19.

Type locality. Park City, Wahsatch Mountains, Utah.

Geogr. Distr. Washsatch Mountains, Utah.

Genl. Char. Inner black stripe large as outer ; mantle ferruginous chestnut.

Color. Head and shoulders ferruginous chestnut, sides of neck lighter ; rump and outer side of leg suffused with reddish brown ; two black and one light stripe on sides ; under parts dusky yellowish ; feet above whitish. Tail above yellow, black and reddish brown mixed and edged with fulvous ; beneath deep chestnut bordered with black.

Measurements. Total length, 284 ; tail vertebræ, 92 ; hind foot, 43.

102. chrysodeirus. (*Tamias*), Merr., N. Am. Faun., No. 4, 1890, p. 19.

Type locality. Fort Klamath, Oregon.

Geogr. Distr. Oregon, northern California and western Nevada.

Genl. Char. Inner stripe large as outer ; mantle ochraceous.

Color. Top of head rusty chestnut ; sides of face, neck and shoulders ochraceous ; this color more extensive in some specimens than in others ; back grizzled gray ; rump brownish gray ; two black and one yellowish stripe along top of sides ; flanks pale yellow ochraceous ; under parts yellowish white, the plumbeous at base of hairs showing through. Tail above black and yellow mixed, fringe yellowish ; beneath ferruginous bordered with black and fringed with pale ferruginous. Color of tail beneath varies greatly among individuals.

Measurements. Total length, 280 ; tail vertebræ, 95 ; hind foot, 41 ; ear, 23.

a—bernardinus. (*Spermophilus*), Nelson, Science, 1898, Dec., p. 782.

brevicaudus. Merr., Proc. Biol. Soc. Wash., 1893, p. 134.

Type locality. San Bernardino, California.

Geogr. Distr. Southern California.

Genl. Char. Similar to *T. chrysodeirus*, but tail and hind foot shorter.

Color. Head and neck to shoulders dull fulvous ; white stripe and two black ones on sides of back ; back and rump grizzled gray with a brown tinge. Tail above, basal half grizzled gray ; remainder black edged with fulvous ; beneath chestnut bordered with black and fringed with fulvous. Hind feet whitish.

Measurements. Total length, 242 ; tail vertebræ, 77 ; hind foot, 34 ; ear, 16.

103. wortmani. (*Tamias*), Allen, Bull. Amer. Mus. Nat. Hist., 1895, p. 335.

Type locality. Kinney Ranch, Bitter Creek, Wyoming.

Geogr. Distr. Wyoming, limits of range unknown.

Gent. Char. Inner black lateral band obsolete.

Color. Above yellowish gray mixed with black and tinged with vinaceous; a broad yellowish white line and one of black on each side; top of head vinaceous; sides of neck and shoulders deep ochraceous; sides straw yellow; beneath buffy white, dusky base of hairs showing through. Tail above dusky edged with fulvous; below pale fulvous bordered with black.

Measurements. Average total length, 280; tail vertebræ, 95; hind-foot, 42.

B. Ammospermophilus.

Size small. Skull very broad for its length; interorbital constriction very slight; nasals short, rather broad and equal in length to the premaxillaries. First premolar less than half the second in size. Tail one-third the length of head and body.



FIG. 18. SPERMOPHILUS (AMMOSPERMOPHILUS) LEUCURUS.

No. 2155 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 4 times.

UPPER TOOTH ROW.
Enlarged 4 times.

104. *harrisi*. (*Spermophilus*), Aud. & Bach. Quadr., 1854, III, p. 267, pl. 144, fig. 1.

Type locality. Not determined.

Geogr. Distr. Southern Utah and Nevada into California, and south into Arizona and northwestern New Mexico.

Genl. Char. Ears small; tail short, black dorsal stripe wanting; angle of mandibular ramus much developed.

Color. Above grizzled grayish brown tinged with vinaceous posteriorly; narrow white stripes on sides; flanks tinged with pale chestnut; orbital ring and lower part of body yellowish white. Tail flat, above black and white edged with white; beneath white bordered with black and edged with white. Some specimens exhibit little or no differences between the upper and lower sides of the tail.

Measurements. Total length, 260; tail vertebræ, 88; hind foot, 41.

a.—saxicolus. (*Spermophilus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1895, p. 444.

Type locality. Tinajas Altas, Gila Mountains, Yuma county, Arizona.

Geogr. Distr. Gila Mountains in southwestern Arizona, into Sonora.

Genl. Char. Colors pallid; tail rather long.

Color. Like *S. harrisii*, but all hues much paler, and tail longer.

Measurements. Total length, 245; tail vertebræ, 93; hind foot, 40.

105. leucurus. (*Tamias*), Merr., N. Am. Faun., No. 2, 1889, p. 20.

Type locality. San Geronio Pass, California.

Geogr. Distr. California and Utah to Arizona and New Mexico.

Genl. Char. Smaller than *T. harrisii*, tail shorter, below white.

Color. Above grizzled gray, vinaceous on head and rump; outside of legs salmon; white stripe on side of back; under parts white. Tail, above iron gray with indistinct white border; beneath white, bordered with black.

Measurements. Total length, 209; tail vertebræ, 69; hind foot, 38.

a.—cinnamomeus. (*Tamias*), Merr. N. Am. Faun., No. 3, 1890, pp. 51 and 52.

Type locality. Echo Cliffs, Painted Desert, Arizona.

Geogr. Distr. Desert Region, Colorado, Utah, and Arizona.

Genl. Char. Ears, tail, and hind feet larger than in *T. leucurus*.

Color. Upper parts uniform pale cinnamon, lined with black; paler on shoulders, legs and rump; rest of coat similar to *T. leucurus*.

Measurements. Total length, 220; tail vertebræ, 76; hind foot, 40.

106. interpres. (*Tamias*), Merr., N. Am. Faun., No. 4, 1890, p. 21.

Type locality. El Paso, Texas.

Geogr. Distr. Northwestern Texas, limits of range undetermined.

Color. Winter Pelage. Above grizzled gray tinged with vinaceous; shoulder, hips and outer surface of legs ochraceous buff; white

stripe on eyelids and on each side of back; under parts white. Tail, above grizzled gray tinged with fulvous; edge whitish; beneath white.

Measurements. Total length, 226; tail vertebræ, 80; hind foot, 37.

107. *nelsoni*. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1893, p. 129.

Type locality. Tipton, San Joaquin Valley, California.

Geogr. Distr. Central California.

Genl. Char. Similar to *S. leucurus*, but larger; above yellowish brown.

Color. Above yellowish brown; under parts whitish. Tail, above basal third like back, rest black and white with white border, beneath buffy white bordered with black, edged with white.

Measurements. Average total length, 228.6; tail vertebræ, 68.4; hind foot, 40.4.

O. Otospermophilus.

"Skull broad, molars small; edge of outer wall of anteorbital foramen not thickened; coronoid processes of lower jaw long and slender; ears very large, tail long, full, bushy."

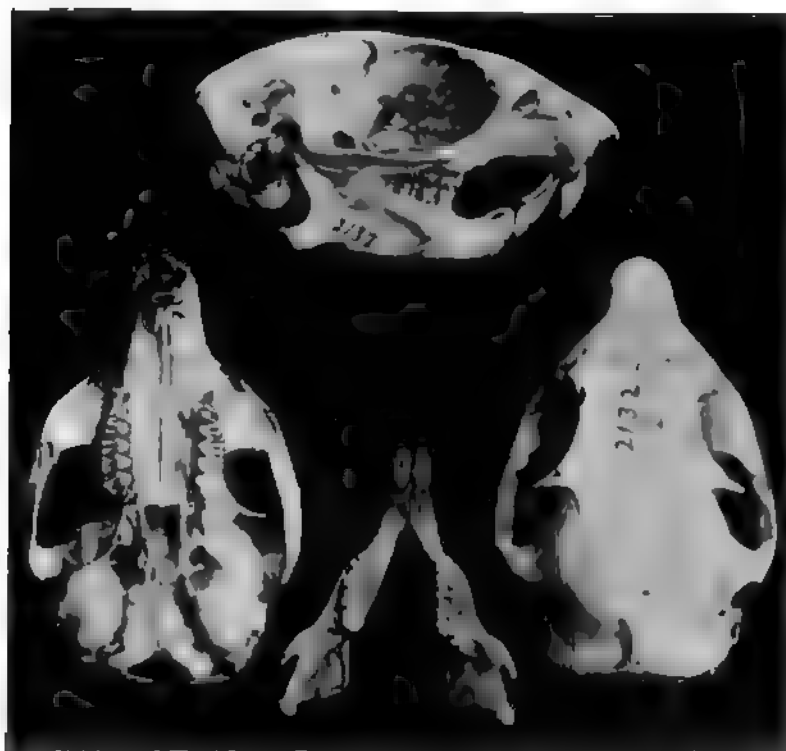


FIG. 19. SPERMOPHILUS (OTOSPERMOPHILUS) GRAMMURUS.
No. 2132 Field Columbian Museum Coll. Nat. size.

108. grammurus. (*Sciurus*), Say, in Long's Exped. Rocky Mts., 1823, 11, p. 72.

couchii. Baird, N. Am. Mamm., 1857, p. 311, pl. 81.

Type locality. Purgatory Creek, Colorado, Lat. $37^{\circ} 32'$; Long. $103^{\circ} 30'$.

Geogr. Distr. Parks of central Colorado, south to Mexico.

Genl. Char. Tail long, full, bushy; ears large, body large, stout; soles of feet smooth.

Color. Above gray mottled with brownish white and black; washed posteriorly with brown; sides of neck and flanks pure gray; inside of limbs brownish white; under parts pale yellowish white, feet gray. Tail grayish white with three black bands.

Measurements. Total length, 530; tail vertebræ, 200; hind foot, 60.

a.—beecheyi. (*Arctomys*), Richard, Faun. Bor. Amer., 1829, 1, p. 170.

californicus, Less. Mamm. and Ois. Nouv., 1847, p. 143.

Type locality. California. Vicinity of San Francisco or Monterey.?

Geogr. Distr. West of Sierra Nevada, northern California.

Genl. Char. Size large, ears large, prominent. Tail more than two-thirds length of body.

Color. Above mixed black and pale yellowish brown; top of head dark brown; sides of head and neck and patch behind the ear yellowish gray, in some lights nearly white; these patches extend in a more or less slender line on either side above shoulders nearly to middle of body; back indistinctly spotted in buff, arranged in somewhat irregular transverse lines. Under parts pale yellowish white, or pale buff. Tail above black sprinkled with yellowish white tipped hairs, and edged with pale yellowish brown, with three black marginal lines, outermost broadest and most distinct, and fringed with yellowish white and tipped with black.

Measurements. Total length, 402; tail vertebræ, 140; hind foot, 60; ear 34.

b.—fisheri. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1893, p. 133.

Type locality. Kern Valley, California.

Geogr. Distr. Western border of Nevada, central and southern California.

Genl. Char. Like *S. beecheyi*, but paler.

Color. Similar to *S. beecheyi*, but sides of neck and shoulder stripes silvery white; body spotted on sides with whitish bordered with dusky; lower part of face whitish; under parts and feet buffy.

Measurements. Total length, 415; tail vertebræ, 175; hind foot, 58.

c.—douglasi. (*Arctomys*), Richardson, Faun. Bor. Amer., 1829, 1, p. 172.

Type locality. Plains of the Columbia River, Oregon.

Geogr. Distr. Northern California, Oregon, (Fort Klamath).

Genl. Char. Size intermediate ; shoulder patches black.

Color. Similar to *S. beecheyi*, except that the patch on neck and shoulders is black instead of brown. Tail hoary above and beneath, and three dark bands visible.

Measurements. Total length, 450; tail vertebræ, 210; hind foot, 66.

d.—buckleyi. (*Spermophilus*), Slack, Proc. Acad. Nat. Scien. Phil., 1861, p. 314.

Type locality. Pack-saddle Mountain, Llano County, Texas.

Geogr. Distr. Central Texas.

Genl. Char. Size large ; head and shoulders black ; ears small ; soles naked.

Color. Head, neck and shoulders above black ; the extent of this color varies greatly among individuals ; rest of pelage grizzled white and black. Throat, sides of neck and belly dark ochre ; middle of belly grayish white. Tail grizzled brown and black with irregular, ill defined, black bands.

Measurements. Total length, 513; tail vertebræ, 192; hind foot, 55.

D. Colobotis.

Skull abruptly narrowed between orbits; zygomata heavy, spreading, flattened transversely ; first premolar large ; tail short, narrow ; ears small, almost hidden by fur.

109. empetra. (*Mus*), Pall. Nov. Spec. Glir., 1778, p. 74, (Part).

canadensis, Erxleb. Syst. Anim., 1777, p. 363, (Part).

parryi, Richard. App. Parry's Sec. Voy., 1825, p. 316.

kennicotti, Ross. Canad. Nat. & Geol., 1861, p. 434.

phæognathus, Richard. Faun. Bor. Am., 1829, p. 161.

Type locality. Mackenzie River.

Geogr. Distr. Arctic America from Melville Peninsula to Icy Cape, Bering Sea ; southwest along the Yukon River for a considerable distance, and in the east to the verge of the Barren Grounds, Lat. 65°.

Genl. Char. Body stout and thick ; tail short and bushy ; ears low, broad.

Color. Above mixed white, black and yellowish brown, with numerous blotches formed by the white ; rest of pelage brownish yellow, except top of head, which is cinnamon mixed with black. Orbi-

tal ring pale. Tail above gray, brown and black intermingled, bordered with black and edged with yellowish white; beneath brownish red bordered with black.

Measurements. Total length, 433; tail vertebræ, 75.

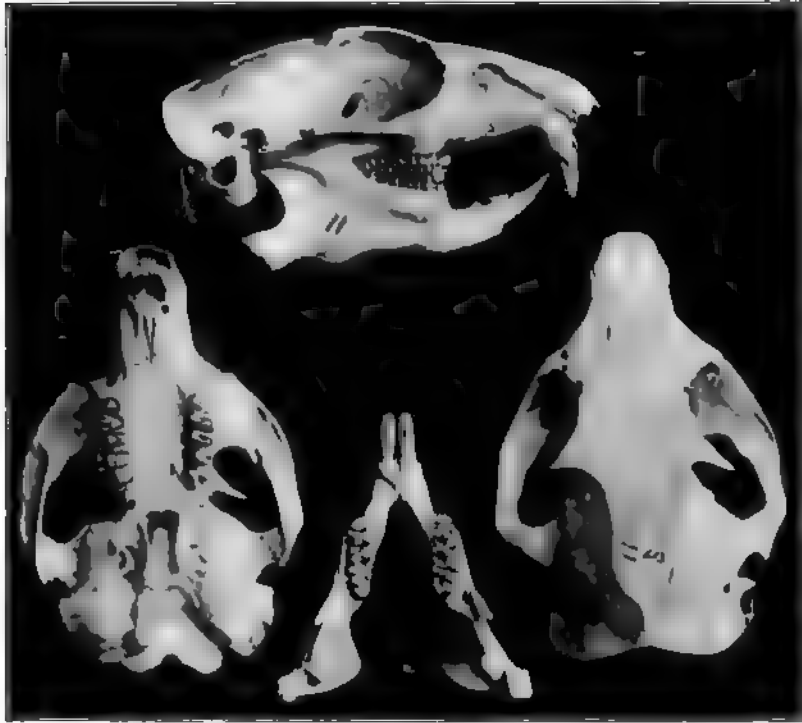


FIG. 20. SPERMOPHILUS (COLOBOTIS) KADIACENSIS.

No. 11 Field Columbian Museum Coll. Nat. size.

a. — kadiacensis. (*Spermophilus*), Allen, Proc. Bost. Soc., 1874, p. 292.

Type locality. Island of Kadiak, Alaska.

Geogr. Distr. Kadiak Island only.

Genl. Char. Equal in size to *S. empetra*, but more gray, white blotches more numerous. Tail shorter.

Color. Above mixed gray, brown and black profusely spotted with white; top of head chestnut; orbital ring yellowish white; flanks gray faintly spotted with white; rest of pelage fulvous or buff; dark colored bases of hairs on under parts showing through. Tail above at base like back, grading into black and edged with fulvous; beneath reddish, with black subterminal bar, and fringed with yellowish.

Measurements. Total length, 398; tail vertebræ, 108; hind foot, 59.

- 110. beringensis.** (*Spermophilus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 20.

Type locality. Cape Lisbourne, Alaska.

Genl. Char. Similar to *S. empetra*; dorsal vermiculations broken into spots; tail longer, color deeper.

Color. Summer Pelage. General color fulvous; ferruginous on nose and underside of tail; back spotted with buffy white; tail bordered with black.

Winter Pelage. Nose patch bright rusty; sides of face and neck buffy gray; back deep fulvous with few white spots; sides and under parts buffy fulvous.

No *Measurements* given!

- 111. osgoodi.** (*Spermophilus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 18.

Type locality. Fort Yukon, Alaska.

Genl. Char. Size large; tail very long; premaxillæ longer than nasals.

Color. Summer Pelage. Top of head deep ferruginous; neck, shoulders and sides grayish; flanks deep fulvous; back fulvous spotted with whitish; sides of face, legs, feet and under parts ferruginous.

Winter Pelage. Similar, but clearer gray on neck and shoulders, thighs and flanks deep ferruginous; vermiculations on back less broken into spots; under parts with grayish and fulvous areas.

Measurements. None given!

- 112. barrowensis.** (*Spermophilus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 19.

Type locality. Point Barrow, Alaska.

Genl. Char. Largest species known; premaxillæ not so long as nasals.

Color. Top and back of head buffy fulvous; neck and sides buffy and black; back buffy fulvous speckled with whitish; beneath, with legs and feet buffy, darkest on breast and belly. Tail above grizzled buffy and black; beneath buffy fulvous bordered with black and fringed with buff.

Measurements. Hind foot, 62. None other given!

- 113. columbianus.** (*Arctomys*), Ord, Guth. Geog. 1815, 11, p. 292.
erythroglutæus, Richard. Faun. Bor. Am., 1829, p. 161.

Type locality. Sources of Elk River, Rocky Mountains, lat. 57°.

Geogr. Distr. Western Montana to Washington and north through British Columbia and Alaska to Plover Bay in Siberia.

Genl. Char. Smaller than *S. empetra*, ears and tail longer. Color darker.

Color. Similar to *S. empetra*, but there is an obscure brownish streak on back ; upper part of neck blackish ; side of face mixed black and white ; hind parts of hips and thighs brownish red, as are also the feet. Light markings fulvous.

Measurements. Total length, 370; tail vertebræ, 88; hind foot, 44.

114. richardsoni. (*Arctomys*), Sabine, Trans. Linn. Soc., 1822, p. 389, pl. 28.

guttatus, Rich. Faun. Bor. Am., 1829, p. 162. (nec Temm).

Type locality. Carlton House, Arctic America.

Geogr. Distr. From Aberdeen, South Dakota, to North Dakota and Montana, west to Rocky Mountains and north to the Saskatchewan River to latitude 55°.

Genl. Char. Small, tail one-third length head and body ; ear short.

Color. Above grayish buff mixed with black and dotted with buff ; neck, shoulders and under parts light buff, shading gradually into the color of upper parts. Tail above rusty brown and black, edged with yellowish white ; beneath buff.

Measurements. Average total length, 311 ; tail vertebræ, 82 ; hind foot, 46.

115. townsendii. (*Spermophilus*), Bachm. Jour. Acad. Nat. Scien. Phil., 1839, p. 61.

Type locality. Plains of Columbia near mouth of Walla Walla River.

Geogr. Distr. Nebraska westward to Plains of Columbia River, and from Wyoming and Utah to Montana, Idaho and Oregon.

Genl. Char. Small ; ears very small ; tail short ; colors dark.

Color. Above gray and black mixed, with a wash of dark reddish brown along back, and all indistinctly mottled. Rump and outside of legs reddish brown ; under parts grayish white tinged with brownish yellow. Tail above black, edged with yellowish white ; beneath reddish.

Measurements. Total length, 305 ; tail vertebræ, 90 ; hind foot, 37.

116. mollis. (*Spermophilus*), Kennicott, Proc. Acad. Nat. Scien. Phil., 1863, p. 158.

Type locality. Camp Floyd, Utah.

Geogr. Distr. Utah and Nevada, exact range not determined.

Genl. Char. Form stout ; muzzle short, compressed, ears rudimentary ; feet large, claws weak, compressed.

Color. Above variegated silvery gray, yellowish brown and black ; under parts silvery gray washed with creamy yellow. Tail above

yellowish brown, mixed with black, bordered and tipped with white ; below reddish brown fringed with white.

Measurements. Total length, 208 ; tail vertebræ, 45.

a. — stephensi. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1898, p. 69.

Type locality. Queen Station, Owens Valley, Nevada, 6,000 feet.

Geogr. Distr. Nevada.

Genl. Char. Similar to *S. mollis*, but head and shoulders pinkish buff.

Color. Summer Pelage. Head and neck to shoulders pinkish buff ; below yellowish buff ; rest of upper parts vinaceous buff mixed with brown ; under parts buffy. Tail above and below grizzled buff, fringed with buff.

Measurements. Total length, 209 ; tail vertebræ, 49 ; hind foot, 32.

b. — yakimensis. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1898, p. 70.

Type locality. Mabton, Yakima County, Washington.

Geogr. Distr. Eastern Washington.

Genl. Char. Like *S. mollis*, but grayer and tail shorter. Nasals long.

Color. Above grizzled buffy gray ; cheeks and sides of neck grayish tinged with yellowish ; under parts pale buff. Tail grizzled fulvous, like *S. mollis*.

Measurements. Total length, 215 ; tail vertebræ, 48 ; hind foot, 34.2.

c. — canus. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1898, p. 70.

Type locality. Antelope, Wasco County, Oregon.

Geogr. Distr. Northern Oregon, range not determined.

Genl. Char. Similar to *S. mollis*, but smaller ; shorter hind feet and tail.

Color. Above grizzled gray and dusky ; cheeks and sides of neck grayish ; thighs dark, suffused with fulvous ; under parts grizzled buffy gray. Tail grayer than in *S. mollis*.

Measurements. Total length, 198 ; tail vertebræ, 40 ; hind foot, 30.3.

117. armatus. (*Spermophilus*), Kennicott, Proc. Acad. Nat. Scien. Phil., 1863, p. 158.

Type locality. Fort Bridger, Utah.

Geogr. Distr. Utah, Wyoming, Idaho and Montana, precise range not determined.

Genl. Char. Stout ; ears large ; feet large ; tail short, bushy ; pelage soft.

Color. Above dark gray and black, washed with dark brown on middle of the back; shoulders, rump and thighs ochraceous brown. Under parts silvery gray tinged with yellowish, dark bases of hairs showing through. Tail, above and below mixed gray and black, subterminal black border, and black tip edged with gray.

Measurements. Total length, 254; tail vertebræ, 50.

118. elegans. (*Spermophilus*), Kennicott, Proc. Acad. Nat. Scien. Phil., 1863, p. 158.

richardsoni var. *townsendi*, Allen, Mon. Roden., 1877, p. 848 (nec. Bach.).

Type locality. Fort Bridger, Utah.

Geogr. Distr. Wyoming and Utah. Range undetermined.

Genl. Char. Slender; head narrow, tapering; ears rounded, distinct; tail flat, short; feet moderately large.

Color. Above pale dusky gray mottled indistinctly with dark brown and washed with brownish; under parts grayish white tinged with pale yellowish brown; rump and thighs yellowish brown; chin, throat, and inside of limbs white. Tail, above like back, but tinged with yellowish brown, and with a subterminal border and bar of black edged with whitish; beneath yellowish brown with an indistinct border and bar of black, edged with whitish.

Measurements. Total length, 177-255; tail to end of hairs, 88-114.

119. beldingi. (*Spermophilus*), Merr., Ann. Acad. Nat. Scien., 1888, p. 317, fig.

Type locality. Donner, California.

Geogr. Distr. California.

Genl. Char. Size equal to *S. townsendi*; claws long, strong, nearly straight; hind feet with posterior third of sole, hairy; tail not bushy; ears large.

Color. Dorsal band bright rufous; sides and under parts grizzled yellowish gray; tail chestnut beneath, subterminal band black, better shown beneath than above; upper part rufous bordered with black and yellowish. Top of head rufous, chin and throat whitish. Feet light yellowish gray.

Measurements. Total length, 275-300; tail vertebræ, 76-89; hind foot, 45; ear 6.

120. oregonus. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1898, p. 69.

Type locality. Swan Lake Valley, Klamath, Oregon.

Geogr. Distr. Known from type locality.

Genl. Char. Similar to *S. beldingi*, but gray and without red dorsal area and head patch.

Color. Above grizzled buffy gray, inclining to fulvous on back; under parts buff, feet whitish buff. Tail like back at base; remainder black and fulvous, edged with hoary and tip black; below chestnut bordered with black and fringed with hoary.

Measurements. Total length, 265; tail vertebræ, 57; hind foot, 42.

E. Xerospermophilus.

Size small. Skull short, broad, interorbital space broad, constriction one-third less the widest part; nasals broad, not so long as premaxillaries. First premolar one-third the second in size. Tail one-third the length of head and body.



FIG. 21. SPERMOPHILUS (XEROSPERMOPHILUS) MICROSPILOTUS.

No. 703 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 4 times.

LOWER TOOTH ROW.
Enlarged 4 times.

121. *obsoletus*. (*Spermophilus*), Kennicott, Proc. Acad. Nat. Scien., Phil., 1863, p. 157.

Type locality. Nebraska.

Geogr. Distr. Black Hills, South Dakota, into Nebraska, and westward to Utah.

Genl. Char. Head narrow, nose long, pointed; tail short, ears small.

Color. Above sandy gray grizzled with white, spotted indistinctly posteriorly with whitish; stripe under eye, nose, and edge of

ears light reddish brown; under parts whitish tinged with sandy brown. Tail, above like back, mixed with black, bordered and tipped with whitish; beneath light reddish brown, indistinct subterminal black border and tipped with whitish.

Measurements. Total length, 205; tail vertebræ, 50.

122. *spilosoma*. (*Spermophilus*), Bennett, Proc. Zool. Soc., 1833, p. 40. *mexicanus*, Aud. & Bach. Quad. N. Am., 1853, 111, p. 42, pl. cix.

Type locality. California, near Mexican boundary.

Geogr. Distr. Southern California to New Mexico (Fort Stanton) and El Paso, Texas, south into Mexico.

Genl. Char. Size small; ears very short, tail about half the length of body.

Color. Above reddish brown spotted with white, bordered with black posteriorly in the young; under parts yellowish white. Tail, above like back, with subterminal black bar, tip yellowish brown; beneath brownish yellow, bordered with black and fringed with yellowish.

Measurements. Total length, 255; tail vertebræ, 75; hind foot, 32.

a.—*microspilotus*. (*Spermophilus*), Merr., N. Am. Faun., No. 4, 1890, p. 38.

Type locality. Oracle, Pinal county, Arizona.

Geogr. Distr. Southern Arizona.

Color. Above russet brown; dorsal spots white bordered posteriorly with dusky; under parts whitish. Tail, above basal half like back, remainder mixed buff and black, bordered with buff; beneath pale ochraceous buff, with indistinct submarginal black band.

Measurements. Total length, 220; tail vertebræ, 74; hind foot, 30.

b.—*major*. (*Spermophilus*), Merr., N. Am. Faun., No. 4, 1890, p. 39.

Type locality. Albuquerque, New Mexico.

Geogr. Distr. Eastern New Mexico.

Genl. Char. Size large, colors intermediate.

Color. Above broccoli brown; dorsal spots indistinct, bordered posteriorly with dusky; under parts white. Tail, above pale reddish brown on basal half, buff brown bordered with black and edged with pale buff on remainder; beneath buff, bordered by indistinct black band.

Measurements. Total length, 234; tail vertebræ, 80; hind foot, 35.

c.—*pratensis*. (*Spermophilus*), Merr., N. Am. Faun., No. 3, 1890, p. 55.

Type locality. San Francisco Mountain, Arizona.

Geogr. Distr. San Francisco Mountain, northwestern Arizona.

Genl. Char. Similar to *S. spilosoma*, but larger, darker.

Color. Above russet hazel, spotted with white, bordered posteriorly with blackish; under parts whitish. Basal half of tail above like back, remainder black bordered with yellowish brown; beneath yellowish, basal band of rufous, and subterminal black border.

Measurements. Total length, 197; tail vertebræ, 60; hind foot, 28.

d.—obsidianus. (*Spermophilus*), Merr., N. Am. Faun., No. 3, 1890, p. 55.

Type locality. San Francisco Mountain, northwestern Arizona.

Geogr. Distr. Cedar Belt, northeast of San Francisco Mountain, Arizona.

Genl. Char. Dark form of Spotted *Spermophile*. Similar to *S. s. pratensis*, longer hind feet and tail, and colors darker.

Color. Above dull sepia brown; dorsal spots whitish.

Measurements. Total length, 190; tail vertebræ, 65; hind foot, 33.

e.—annectans. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1893, p. 132.

Type locality. Padre Island, Texas.

Geogr. Distr. Mustang and Padre Islands, Texas; the former island probably the northern limit of the subspecies.

Genl. Char. Similar to *S. s. major*, but grayer.

Color. Above grayish brown spotted with buffy, margined posteriorly with dusky; under parts whitish. Tail like back, apical two-thirds bordered with black, tips of hairs buffy ochraceous.

Measurements. Total length, 220; tail vertebræ, 60; hind foot, 36.

123. cryptospilotus. (*Spermophilus*), Merr., N. Am. Faun., No. 3, 1890, p. 57.

Type locality. Tenebito Wash, 25 miles east of the Little Colorado, Arizona.

Geogr. Distr. Painted Desert, Arizona.

Genl. Char. Color pale, dorsal spots absent in worn pelage.

Color. Above buffy clay color, sometimes tinged with vinaceous cinnamon. Tail like back above, yellowish below with indistinct subterminal black band.

Measurements. Total length, 190; tail vertebræ, 60; hind foot, 32.

124. canescens. (*Spermophilus*), Merr., N. Am. Faun., No. 4, 1890, p. 38.

Type locality. Wilcox, Cochise county, Arizona.

Geogr. Distr. Southeastern Arizona.

Genl. Char. Similar to *S. spilosoma*, ground color drab gray, no fulvous; dorsal spots inclining to coalesce laterally.

Color. Above drab gray and hoary; head and face hoary; back covered with elongate whitish markings forming transverse bars.

Eyelids and under parts white. Tail, above grizzled grayish drab, terminal third blackish, bordered with buff; beneath buff with subterminal black band.

Measurements. Total length, 156; tail vertebræ, 60; hind foot, 28.

125. mohavensis. (*Spermophilus*), Merr., N. Am. Faun., No. 2, 1889, p. 15.

Type locality. Mojave River, California.

Geogr. Distr. Mojave Desert, California.

Genl. Char. Size equal to *S. tereticaudus*; tail about half the length of body; feet large; ears rudimentary.

Color. Above grizzled grayish brown; beneath whitish; tail above like back mixed with black, bordered with white; below white, bordered by black.

Measurements. Total length, 230; tail vertebræ, 68; hind foot, 38.

126. tereticaudus. (*Spermophilus*), Baird, N. Am. Mamm., 1857, p. 315.

Type locality. Fort Yuma, California.

Geogr. Distr. Central California to Southern Arizona on Tucson Plain.

Genl. Char. Tail as long as four-fifths head and body; no spots on body, feet broad, soles hairy.

Color. Above grizzled grayish brown; beneath brownish white. Tail like back, brown at end, tip yellowish.

Measurements. Total length, 248; tail vertebræ, 112; hind foot, 35.

127. neglectus. (*Spermophilus*), Merr., N. Am. Faun., No. 2, 1889, p. 17.

Type locality. Dolan's Springs, Arizona.

Geogr. Distr. Arizona.

Genl. Char. Similar to *S. tereticaudus*; tail and hind feet shorter; soles densely haired; tail half as long as head and body.

Color. Above grizzled grayish brown; beneath yellowish white. Tail, above and below like back with a subterminal black border.

Measurements. Total length, 278; tail vertebræ, 74; hind foot, 32.

128. mexicanus. (*Citillus*), Licht. Darst. Neu. Säug., 1830, pl. 31, fig. 2.

Type locality. Toluca, Mexico.

Geogr. Distr. In United States, vicinity of the Rio Grande, Texas and southern New Mexico.

Genl. Char. Tail about half as long as body; ears short, size medium.

Color. Above dark yellowish to reddish brown, with nine or

eleven lines of white spots; beneath yellowish white. Head above mixed white, black and yellowish; orbital ring and lower side of cheek, white; tail, above black and yellowish white, bordered with black and edged with yellowish white; beneath brownish white, bordered with black, and fringed with brownish white.

Measurements. Total length, 305; tail vertebræ, 100; hind foot, 42.

a.—parvidens. (*Spermophilus*), Mearns, Proc. U. S. Nat. Mus., xviii 1896, p. 443.

Type locality. Fort Clark, Kinney county, Texas.

Geogr. Distr. Southwestern Texas.

Genl. Char. Similar to *S. mexicanus*, but smaller, colors paler, teeth weak.

Color. Pattern like *S. mexicanus*, colors paler, under parts white; hairs of tail with two black rings instead of three, and tips grayish instead of yellowish; back yellowish broccoli brown.

Measurements. Total length, 325; tail vertebræ, 130; hind foot, 44.

F. *Ictidomys*.

Skull long, narrow; nasals long, broad; zygomata not spreading, weak; tail long, more than two-thirds the length of the body and head; ears small.

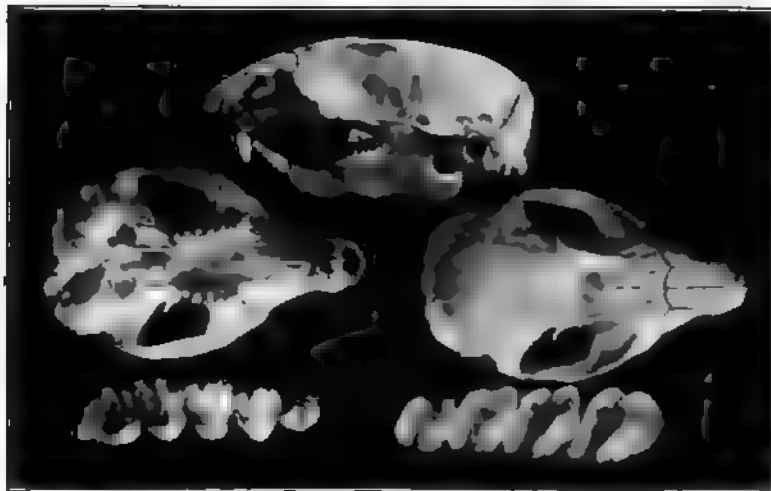


FIG. 22 SPERMOPHILUS (ICTIDOMYS) 13-LINEATUS.

No. 17 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 4 times.

LOWER TOOTH ROW.
Enlarged 5 times.

129. tridecemlineatus. (*Sciurus*), Mitch. Med. Rep., 1821, p. 248.

hoodi, Sabine, Trans. Linn. Soc., 1823, p. 590, pl. 29.

Type locality. Upper Mississippi; central Minnesota?

Geogr. Distr. Central North America; eastern Michigan to Montana and Colorado, and central Texas north to Saskatchewan Plains in Canada, and in prairie region of the Mississippi from Ohio to Minnesota.

Genl. Char. Slender; ears small, auricle merely a projecting rim; tail little more than half the length of body and head.

Color. Above dark brown, ranging from chestnut to nearly black; along back are seven yellowish white lines, alternating with six rows of yellowish spots; rest of body pelage buff or ash buff. Tail black above, and beneath varied with chestnut and fringed with white.

Measurements. Total length, 252; tail vertebræ, 88; hind foot, 33.

a.—pallidus. (*Spermophilus*), Allen, Proc. Bost. Soc. Nat. Hist., 1874, p. 291.

Type locality. Plains of lower Yellowstone River.

Geogr. Distr. Wyoming south to Texas and east to Missouri, on the plains and desert regions.

Genl. Char. Small; colors pale; light stripes white and wide.

Color. Very similar to *S. t. olivaceus*, possibly slightly paler; tail, above black and white mixed, narrowly bordered and tipped with whitish; below chestnut; subterminal indistinct black bar, sides fringed with whitish; tip same hue.

Measurements. Total length, 210; tail vertebræ, 75; hind foot, 32.

b.—olivaceus. (*Spermophilus*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 337.

Type locality. Custer, Black Hills, South Dakota.

Geogr. Distr. South Dakota.

Genl. Char. Similar to *S. t. pallidus*, but darker.

Color. Above dusky or blackish brown; flanks, stripes and spots pale buff, tinged with olive; beneath buff. Basal half of tail above black and white mixed, narrowly bordered and tipped with whitish; below dark buff, subterminal black bar; sides fringed with whitish, tip same hue.

Measurements. Average total length, 252; tail vertebræ, 89; hind foot, 34.5.

c.—parvus. (*Spermophilus*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 337.

Type locality. Uncompahgre Indian Reservation, northeastern Utah.

Geogr. Distr. Utah and Wyoming.

Genl. Char. Smaller than *S. 13-lineatus*, or *S. t. olivaceus*.

Color. Breeding Pelage. Above deep russet and blackish; spots and stripes grayish white tinged with cream color; feet and under parts white with dark bases of hairs perceptible.

Measurements. Average total length, 204; tail vertebræ, 80; hind foot, 30.6.

d.—alleni. (*Spermophilus*), Merr., Proc. Biol. Soc. Wash., 1895, p. 71.

Type locality. Bighorn Mountains, Wyoming.

Geogr. Distr. Wyoming, range not determined.

Genl. Char. Small; colors dark, stripes and spots less reddish than in *S. 13-lineatus*.

Color. Similar to *S. 13-lineatus*, but nearly as small as *S. t. parvus*. Above as in species compared; light spots and dorsal rows longer than in *S. 13-lineatus*, and tail darker and less reddish.

Measurements. Total length, 211; tail vertebræ, 74; hind foot, 32.

e.—texensis. (*Spermophilus*), Merr., Proc. Biol. Soc., 1898, p. 71.

Type locality. Gainsville, Cook County, Texas.

Geogr. Distr. Northern Texas and Oklahoma Territory, range unknown.

Genl. Char. Similar to *S. 13-lineatus*, but smaller.

Color. Winter Pelage. Above deep ferruginous, grizzled with black; sides of neck, feet and under parts buffy; dorsal stripes and spots buffy white. Tail beneath rusty, mixed and edged with buff, subterminal black bar, tip buff. Above dark buff bordered with black and fringed with buff.

Measurements. Total length, 270; tail vertebræ, 92; hind foot, 33.

f.—badius. (*Spermophilus*), Bangs, N. Eng. Zool. Club, 1899, p. 1.

Type locality. Statesbury, Missouri.

Geogr. Distr. Missouri, range undetermined.

Genl. Char. Larger than *S. t. texensis*, colors darker.

Color. Winter Pelage. Above chestnut; stripes and spots buff; rest of pelage buff, hairs of under parts plumbeous at base. Tail above chestnut, below ferruginous bordered with black and edged with buff.

Measurements. Total length, 276; tail vertebræ, 98.4; hind foot, 35.

130. franklini. (*Arctomys*), Sabine, Trans. Linn. Soc., 1822, p. 587, pl. 27.

Type locality. Carlton House, Saskatchewan River, Manitoba.

Geogr. Distr. Valley of Saskatchewan, and through those of the Red River and Mississippi, to the Dakotas and central Kansas. Eastern limit western Indiana.

Genl. Char. Size rather large; tail more than half the length of head and body; ear very small.

Color. Above yellowish brown spotted obscurely with black; top and sides of head and neck, rump and thighs gray; beneath whitish. Tail grayish white, with three black lines, outermost broad and fringed with white.

Measurements. Total length, 378; tail vertebræ, 139; hind foot, 52.

39. Cynomys.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{1-1}; M. \frac{3-3}{3-3} = 22.$$

Cynomys. Rafin. Month. Mag., 1817, 11, p. 45. Type *Arctomys ludovicianus*. Ord.

Anisonyx, Rafin. Month. Mag., 1817, 11, p. 45.

Cheek pouches shallow; ears rudimentary; tail very short, flat; feet with claws on all five toes; pollex large, nail well developed; pelage short; dentition very heavy; molars large with three transverse grooves on their crowns; first and second premolars nearly equal in size; outline of molar series curved, divergent anteriorly, approximating posteriorly; postorbital processes strong, well developed, decurved; anteorbital foramen large subtriangular, the tubercle at end large and visible when viewed from above, and projecting beyond the superior outline of skull; palate greatly contracted posteriorly; occipital and sagittal crests present.

131. ludovicianus. (*Arctomys*), Ord., Guth. Geog., 1817, p. 292.

socialis, Rafin. Am. Month. Mag., 1817, 11, p. 45.

grisea, Rafin. Am. Month. Mag., 1817, 11, p. 45.

missouriensis, Warden, Descrip. États-Unis, v. 1820, p. 627.

latrans, Harlan, Faun. Am., 1825, p. 306.

Type locality. Plains of the Upper Missouri.

Geogr. Distr. Western Texas to 49th parallel, and western Kansas to eastern base of the Rocky Mountains.

Genl. Char. Body stout; tail short; ears very small; claws long.

Color. Summer Pelage. Above reddish brown, varied with gray and black hairs; beneath yellowish white. Tail like the back with the apical third black.

Winter Pelage. Above pale vinaceous buff, grizzled and mixed with black; below pale buff.

Measurements. Total length, 393; tail vertebræ, 88; hind foot, 57.

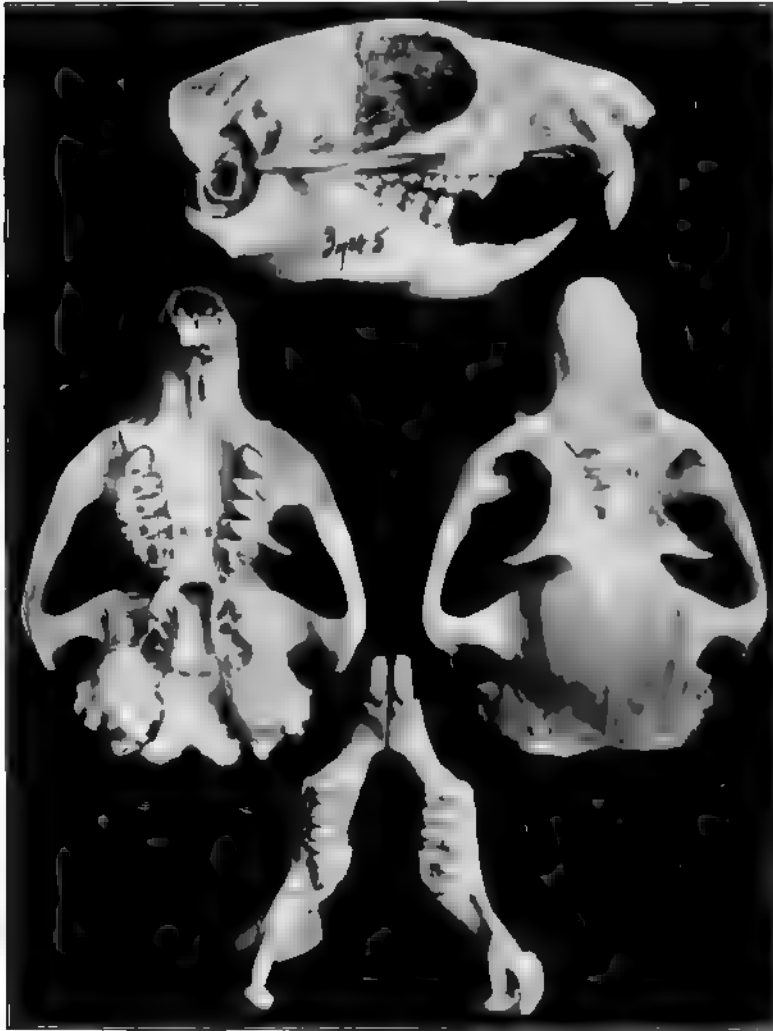


FIG. 23. *CYNOMYS LUDOVICIANUS*.
No. 3745 Field Columbian Museum Coll. Nat. size.

132. gunnisoni. (*Cynomys*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 334.

Type locality. Coachetope Pass, Rocky Mountains.

Geogr. Distr. New Mexico and Arizona.

Genl. Char. Smaller than *C. ludovicianus*, tail one-sixth length of body.

Color. Summer Pelage. Above tawny fulvous, mixed with black;

under parts pale fulvous; tail like back on basal half, rest mixed black and white bordered and tipped with white.

Winter Pelage. Above pale buff, mixed with black; under parts pale yellow to fulvous.

Measurements. Average total length, 360; tail vertebræ, 69; hind foot, 60.

133. lewisii. (*Arctomys*), Aud. & Bach., Quad. N. Am., III, 1853, p. 32, pl. cvii.

leucurus, Merr., N. Am. Faun., No. 4, 1890, p. 33.

Type locality. Wyoming.

Geogr. Distr. Wyoming, Utah in Uncompahgre Indian Reservation.

Genl. Char. Similar to *C. gunnisoni*, but two-thirds of tail white.

Color. Above grizzled; grayish buff mixed with black on rump; black patch over eye and a black and buff one below the eye; thighs buff; under parts buffy white. Tail, basal half like back; terminal half white.

Measurements. Total length, 335; tail vertebræ, 53; hind foot, 58.

134. arizonensis. Mearns, Bull. Am. Mus. Nat. Hist., 1890, p. 305.

Type locality. Point of Mountain, near Wilcox, southern Arizona.

Geogr. Distr. Southern Arizona.

Genl. Char. Size large; tail nearly twice as long as *E. gunnisoni*.

Color. Summer Pelage. Above vinaceous-cinnamon; below whitish; tail with a narrow subterminal bar of broccoli brown.

Winter Pelage. Above pale sandy buff; below white tinged with buff.

Measurements. Average total length, 376; tail vertebræ, 84; hind foot, 61.

40. *Arctomys*.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{1-1}; M. \frac{3-3}{3-3} = 22.$$

Arctomys. Schreb. Säugeth., 1792, p. 770. Type *A. marmotta*, Linn.

Mus. Linn. Syst. Nat., 1758, 1, p. 601 (Part).

Glis. Erxleb. Syst. Regn. Anim., 1777, p. 358 (Part).

Form stout, heavy, legs short; tail short, stout, hairy; cheek pouches small; fore feet with a rudimentary pollex having a flat nail. Skull heavy; superior outline nearly straight to posterior portion of nasals when it curves downward; interorbital region depressed; post-orbital processes broad at base, stout, decurved, and at right angles to axis of skull; zygomata expanded; molar series with two transverse grooves across their crowns, nearly parallel, barely converging

posteriorly. First premolar slightly smaller than the second; palate broad, of nearly equal width throughout its length; bullæ inflated, moderately large.



FIG. 24. ARCTOMYS MONAX.

No. 495 Field Columbian Museum Coll. $\frac{1}{4}$ nat. size.

135. monax. (*Mus*), Linn. Syst. Nat., 1758, 1, p. 60.

Type locality. Maryland.

Geogr. Distr. From New York to Georgia, west to the Dakotas, intergrading in the Alleghanian and Canadian faunæ with next three species.

Genl. Char. Body robust, heavy; ears large and rounded; tail less than half the length of body, bushy. Color verging from almost black to yellowish or whitish gray.

Color. Crown and upper parts usually brownish black; nose and chin gray; cheeks and throat yellowish white; under parts brownish chestnut; feet black or dark brown. Tail black.

Measurements. Total length, 484; tail vertebrae, 114; hind foot, 80.

a.—ignavus. (*Arctomys*), Bangs, Proc. N. Eng. Zool. Club, 1899, p. 13.

Type locality. Black Bay, Labrador.

Geogr. Distr. Labrador, range unknown.

Genl. Char. Similar to *A. monax*, but colors darker.

Color. Upper parts, burnt umber and light yellowish brown. Top of head dark Mars brown; nose whitish; sides of head grizzled pale yellowish. Under parts dull ferruginous; feet black. Tail brownish black.

Measurements. Total length, 569; tail vertebræ, 136; hind foot, 85.

b.—canadensis. (*Glis*), Erxleben, Syst. Anim., 1777, p. 363.

melanopus, Kuhl. Beitr., 1820, p. 64.

Type locality. Quebec, Canada.

Geogr. Distr. Newfoundland to Bering Sea; and from 57° N. latitude to central New England; west to northeastern Minnesota.

Color. Face blackish, cheeks gray, nose black. Hairs on the back gray at base, black in the center, whitish or hoary at tip. Beneath golden buff. Feet black. Tail short, blackish.

136. pruinus. (*Arctomys*), Gmel. Syst. Nat., 1788, p. 144.

caligatus, Eschsch., Zool. Atlas, 1829, 11, pl. 6.

Type locality. Hudson Bay?

Geogr. Distr. Columbia River northward to the Barren Grounds, east to Hudson Bay.

Genl. Char. Size large; nasals not extending beyond maxillaries; anterior suture of frontals nearly straight.

Color. Above anteriorly grayish white, varied with black; posteriorly grayish fulvous and black; under parts grayish white; nose, muzzle and chin grayish white; feet black. Tail, hairs reddish brown or black basally, then yellowish white.

Measurements. Total length, 750; tail vertebræ, 180.

137. flaviventer. (*Arctomys*), Aud. & Bach., Proc. Acad. Nat. Scien. Phil., 1841, p. 99.

Type locality. "Mountains between Texas and California!"

Geogr. Distr. Western Texas, New Mexico and Arizona north to 49th parallel.

Genl. Char. Size moderate; ears small; tail bushy, about half as long as body. General color mixed yellowish brown and gray to brownish black.

Color. Above fulvous, yellowish brown and gray, mixed; below golden to reddish chestnut. Nose and chin whitish gray. Tail rusty yellow; feet blackish.

Measurements. Total length, 635; tail, 178; hind foot, 65.

138. dacota. (*Arctomys*), Merr., N. Am. Faun., No. 2, 1889, p. 8.

Type locality. Custer, Black Hills.

Geogr. Distr. South Dakota; range not determined.

Genl. Char. Size large. Tail long and bushy. Hairs on shoulders elongated forming a mantle.

Color. Above pale yellowish brown mixed with black posteriorly. Head black, face and sides of neck grizzled with white and reddish brown; muzzle white. Under parts rusty chestnut; feet and hind legs mixed with yellowish and rusty chestnut. Tail, above rusty chestnut; below with a median black band.

Measurements. Total length, 670; tail, 188; hind foot, 86; ear, 13.

139. olympus. (*Arctomys*), Merr., Proc. Acad. Nat. Scien. Phil., 1898, p. 352.

Type locality. Solduc Trail, Timber line, Olympic Mountains, Washington.

Geogr. Distr. High Mountains, western Washington.

Genl. Char. Size equal to *A. pruinosus*; color very different.

Color. Summer Pelage. Upper parts yellow ochraceous; legs and feet dark brown to almost pure black; chin and nose white; dark bar across face between nose and eyes.

Winter Pelage. General color bluish gray.

Measurements. Total length, 750; tail vertebræ, 210; hind foot, 110.

II. Sub. Fam. **Pteromyinae.**

41. Sciuropterus.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{1-1}; M. \frac{3-3}{3-3} = 22.$$

Sciuropterus. F. Cuv. Ann. du Mus., 1825, x, p. 126, pl. x. Type *Sciurus volans*, Linn.

Limbs connected by a furred membrane extending outwardly from the sides, and supported by a process from the olecranon. Tail depressed, flattened, thick; ears large; pelage of velvet softness.

140. sabrinus. (*Sciurus*), Shaw, Gen. Zool., 1, 1801, p. 157.

hudsonius, Gmel. (nec. Pall), Syst. Nat., 1788, 1, p. 153.

acrobates, Schreb. Säugth., 1792, lv, pl. ccxxll, B.

Type locality. Severn River, James Bay, Canada.

Geogr. Distr. Boreal North America, south to northern New York and southern New Hampshire.

Genl. Char. Largest of eastern flying squirrels; hind foot large; tail broad; summer and winter pelage different; soles of feet furred, pads naked.

Color. Summer Pelage. Upper parts sooty drab; beneath dirty white; base of hairs plumbeous; tail, beneath yellowish white tinged with sooty drab.



FIG. 25. SCIUROPTERUS VOLANS.

No. 928 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 4 times.UPPER TOOTH ROW.
Enlarged 4 times.

Winter Pelage. Upper parts wood brown, or cinnamon, tinged with yellow; tip of tail sooty; feet and hands above sooty gray; cheeks gray; black orbital ring; ears dusky.

Measurements. Total length, 278.6; tail vertebræ, 130.4; hind foot, 37.6.

a.—macrotis. (*Sciuropterus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1899, p. 353, figs. 1, 2, 3.

Type locality. Hunter Mountain, Green county, New York.

Geogr. Distr. Northern border of United States, east of the Great Lakes.

Genl. Char. Smaller than typical *S. sabrinus*; ears longer, fur more reddish.

Color. Similar to *S. sabrinus*, but more reddish in general hue.

Measurements. Total length, 280; tail vertebræ, 125; hind foot, 38; ear, 20; from notch, 23.5; skull 37.5, by 22.

b.—silus. (*Sciuropterus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 163.

Type locality. Katis Mountain, White Sulphur Springs, West Virginia.

Geogr. Distr. Probably the higher southern Alleghanies.

Genl. Char. Smallest of flying squirrels, similar to *S. sabrinus*, but darker.

Color. Upper parts hair brown, grading to isabella; ears, feet and hands above, and upper surface of tail sooty; black orbital ring; under parts grayish white; under surface of tail drab shading to sooty.

Measurements. Type. Total length, 214; tail vertebræ, 92; hind foot, 28.

141. *volans*. (*Mus*), Linn. Syst. Nat., 1776, 1, p. 85, (*Mus*, nec *Sciurus*, p. 88).

volucella Pall., Nov. Spec. Glir., 1788, p. 351.

Type locality. Virginia.

Geogr. Distr. Northern New York and southern New Hampshire to Florida, west to the plains.

Genl. Char. Size medium; winter and summer pelage alike in color; hairs of under parts white to base.

Color. Upper parts drab shaded with russet, tail slightly darker above, beneath buffy gray; hands above grayish white, feet drab; black orbital ring, and broad black band at edge of wing membrane; under parts pure white, washed in some specimens with buff.

Measurements. Total length, 234.5; tail vertebræ, 99.6; hind foot, 31.4.

a.—querceti. (*Sciuroptera*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 166.

Type locality. Citronelle, Citrus county, Florida.

Geogr. Distr. Peninsular Florida to southern Georgia; west to Louisiana?

Genl. Char. Similar to *S. volans*, more uniform russet, under parts and tail beneath washed with same color.

Color. Upper parts russet, grading to yellowish drab, feet and hands above sooty gray; edge of wing membrane black; under parts white tinged with pinkish russet. Tail, above smoky gray tinged with rusty, beneath pinkish buff.

Measurements. Total length, 237.66; tail vertebræ, 102.66; hind foot, 31.33.

b.—alpinus. (*Pteromys*), Rich. Faun. Bor., 1829, p. 195, pl. 18.

Type locality. Head waters of Elk River, N. W. Alberta.

Geogr. Distr. From the Mackenzie River along east side of the Rocky Mountains to United States border.

Genl. Char. Head and feet larger than *S. sabrinus*; tail longer, elliptical; membrane less full, border straight.

Color. Upper parts yellowish brown, tail blackish brown; under parts grayish white, tail beneath pale brown.

Measurements. Total length, 280; tail vertebræ, 108.

c.—californicus. (*Sciuropterus*), Rhoads, Proc. Acad. Nat. Scien. Phila., 1897, p. 323.

Type locality. San Bernardino Mountains, San Bernardino county, California.

Geogr. Distr. Mountain range, southeastern California.

Genl. Char. Smaller than *S. v. alpinus*, color pale.

Color. Upper parts between drab gray and wood brown. Basal third of tail like back, remainder dark smoke gray. Sides of face and neck pale ash gray, orbital ring mouse gray. Under parts yellowish gray, except throat, inner fore legs and inner margin of thighs, which are white. Tail beneath pale drab.

Measurements. Type. Total length, 286; tail vertebræ, 127; hind foot, 38; ear from crown, 16; length of carpal fascia, 24.

d.—oregonensis. (*Pteromys*), Bachm. Journ. Ac. Phil., 1839, viii, p. 101.

Type locality. "Pine woods of the Columbia near the sea."

Geogr. Distr. Southern Alaska to northern California, at lower elevations of the Pacific slope.

Genl. Char. Intermediate in size between *S. v. alpinus* and *S. volans*; tail long, slender; colors dark.

Color. Above Mars brown with a russet shade, tinged with clay color, hairs black tipped; upper parts of feet, shoulders, membrane, ears and tail, seal brown to slate black; under parts isabella color tinged with rusty. Fore legs beneath, spot on chin, and median line from breast to vent, whitish. About mouth and eyes blackish.

Measurements. Type. Total length, 302; tail vertebræ, 132; hind foot, 39; ear from crown, 15; carpal fascia, 23.5.

e.—olympicus. (*Sciuropterus*), Elliot, Field Columb. Mus., 1899, 1, p. 250, Zoölogy.

Type locality. Happy Lake, Clallam County, Olympic Mountains, Washington.

Geogr. Distr. Northwest Washington, higher parts of the Olympic Mountains.

Genl. Char. Similar to *S. v. fuliginosus* Rhoads, but larger and darker.

Color. Upper parts blackish slate, hairs tipped with rust color; membranes jet black on outer half edged with white, inner half like back; tail above grayish fawn, dark smoky gray at tip, beneath buff; under parts bright buff; legs and feet dark reddish brown; ears dark brown; nose, stripe to eye and orbital ring, black.

Measurements. Type. Total length, 346; tail, 164; hind foot, 38; membrane across shoulder, 200.

Skull: occipito-nasal length, 41; greatest width, 19; nasals, 12; tooth row, 9.

f.—fuliginosus. (*Sciuropterus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1897, p. 314.

Type locality. Martin Station, Kittitass county, Cascade Mountains, Washington.

Geogr. Distr. Cascade, Coast, and Sierra Nevada Mountains, at high elevations.

Genl. Char. Like *S. v. alpinus* in size, but color darker.

Color. Upper parts with under fur slaty drab, hairs tipped with broccoli brown, giving a mottled slaty drab appearance. Upper half of tail like back, rest slaty gray, end blackish slate. Upper surface of membrane slaty drab. Tail beneath smoke gray, bordered with blackish. Under parts light drab gray, tinged with brown on throat at base and lower margin of membrane; orbital ring black. Lower margin of membrane white.

Measurements. Type. Total length, 317; tail, 153; hind foot, 40; ear from crown, 18; length of carpal fascia, 25.

g.—klamathensis. (*Sciuropterus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 225.

Type locality. Fort Klamath, Oregon.

Geogr. Distr. Oregon; range not determined.

Genl. Char. Similar to *S. v. fuliginosus*, but smaller; tail paler above.

Color. Upper parts drab brown; tinged with fulvous brown; under parts yellowish buff. Tail above like back, beneath deep buff; cheeks pale yellowish gray. Top of head grayish fulvous, ears pale.

Measurements. Type. Total length, 329; tail vertebræ, 138; hind foot, 38.

142. stephensi. Merr., Proc. Biol. Soc. Wash., 1900, p. 151.

Type locality. Sherwood, Mendocino county, California.

Genl. Char. Similar to *S. klamathensis*, but smaller and darker.

Color. "In coloration this subspecies resembles *klamathensis* much more closely than *oregonensis*, but it is slightly darker than *klamathensis* and has much smaller ears and audital bullæ. Under parts and under side of tail without trace of fulvous suffusion." (Merr. l. c.)

Measurements. Total length, 277; tail vertebræ, 131; hind foot, 37.

Fam. II. **Haplodontidae.**

Form stout, heavy; limbs short; head broad, flat, triangular; no neck apparent; tail short, terete, hairy; ears moderate; eyes minute; feet plantigrade, five-toed, upper surface hairy, palms and soles naked, claws long, thumb short. Skull massive, depressed, triangu-

lar, broad posteriorly, no postorbital processes; zygomata widest posteriorly; anteorbital foramen oval, obliquely placed; nasals broad; mandible heavy, strong, descending ramus twisted into the horizontal plane; coronoid falcate.

42. *Haplodontia.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{1-1}; M. \frac{3-3}{3-3} = 22.$$

Aplodontia! Rich. Zool. Jour., iv, 1829, p. 334. Type *A. leporina*.

Rich. = *Anisonyx rufa*. Rafin.

Anisonyx, Rafin. Am. Month. Mag., 1817, p. 45. (Part.)

Molars rootless, prismatic, pattern unique, with a prominent salient angle having a cavity on either side, this angle being external on upper molars, internal on the lower. Molar series nearly parallel; first upper premolar very small; incisors rounded anteriorly; palate broad, of about equal width throughout its length. Auditory bullæ small, with tubular meatus projecting beyond posterior angle of the zygoma. Superior outline of skull flat; base horizontal.

143. rufa. (*Anisonyx*), Rafin. Am. Month. Mag., 1817, 11, p. 45.

leporina. Rich. Faun. Bor. Amer., 1829, p. 211, pl. 18 C. Skull and feet.

Type locality. Cascades of Columbia River.

Geogr. Distr. Eastern Washington and Oregon.

Color. Above chestnut or reddish brown; beneath plumbeous; feet and ears whitish. Tail like back.

Measurements. Total length, 305; tail vertebræ, 25; hind foot, 54.

a.—californica. (*Haplodontia*), Peters, Monstab. K. P. Akad. Wissenschaften zu Berlin, 1864, p. 179.

major. Merr., Ann. N. Y. Acad. Scien., 1886, 111, p. 316.

Type locality. California.

Geogr. Distr. California, range not defined.

Color. Above grizzled grayish brown; under fur plumbeous; rump and belly grizzled mouse gray; patch of white on anal region; sooty brown stripe from nose to between eyes.

Measurements. Length of head and body, 340; hind foot, 53; ear, 10.

b.—raineri. (*Aplodontia!*), Merr., Proc. Biol. Soc. Wash., 1899, p. 21.

Type locality. Paradise Creek, Mt. Ranier, Washington.

Geogr. Distr. Washington. Range not determined.

*The specific values of the forms of this genus as here given cannot be said to be satisfactorily determined. More specimens and a better knowledge of their distribution must be obtained.



FIG. 26. HAPLODONTIA CALIFORNICA.
No. 515 Field Columbian Museum Coll. Nat. size.

Genl. Char. Similar to *H. r. californica*, but paler and grayer. Skull: incisive foramina shorter and slightly more open; basi-occipital notch shallower; jugal narrower and more slender.

Color. Like *H. r. californica*, but of a pale and more grayish hue

throughout, especially on the under parts and region around mouth; whiskers mainly white, instead of black. (Vide Merriam, l. c.)

Measurements. Total length, 375; tail vertebræ, 33; hind foot, 62.

144. *pacifica*. (*Aplodontia*!), Merr. Proc. Biol. Soc. Wash., 1899, p. 19.

Type locality. Newport, Yaquina Bay, Oregon.

Geogr. Distr. Oregon, limits of range undetermined.

Genl. Char. Size small; ear long; colors dark.

Color. Winter Pelage. Above fulvous brown mixed with black; head and rump bister; cheeks suffused with fulvous; under parts plumbeous, washed with fulvous; legs, feet and tail grizzled grayish dusky.

Measurements. Total length, 304; tail vertebræ, 22; hind foot, 48.

145. *phaea*. (*Aplodontia*!), Merr. Proc. Biol. Soc. Wash., 1899, p. 20.

Type locality. Point Reyes, Marin County, California.

Geogr. Distr. Unknown.

Genl. Char. Size small; ears short.

Color. General hue uniform bister brown.

Measurements. Total length, 330; tail vertebræ, 30; hind foot, 55.

146. *olympica*. (*Aplodontia*!), Merr. Proc. Biol. Soc. Wash., 1899, p. 20.

Type locality. Queniult Lake, Olympic Mountains, Washington.

Geogr. Distr. Olympic Mountains, Washington, range unknown.

Genl. Char. Similar to *H. rufa* but larger and darker.

Color. Above rufous mixed with black hairs; rump grayish; under parts gray tinged with rufous. Lips white, and some specimens have white spots on the chest and behind ears, but in others these are absent. Base of ear blackish. Skull: "Jugal not obliquely expanded but developing a postorbital ridge or process which forms the only upward projection from the arch—the posterior projection in *rufa*, formed by the thickened anterior end of the squamosal, being absent." (Merr.) This process in a modified form is present in *H. r. californica*, and is of varying dimensions in a series of *H. olympica*; in some being almost obsolete.

Measurements. Total length, 350; tail vertebræ, 35; hind foot, 35.

Fam. III. **Castoridae.**

Skull massive, no postorbital processes, superior outline nearly straight; molars single rooted with re-entering of enamel folds, and decrease in size posteriorly; the molar series is not parallel but converges anteriorly and the palate is arched, contracted anteriorly.

Lower jaw massive; angle of mandible rounded. Incisors large, powerful, the lower much longer than the upper, with chisel-like edges, and deep orange-red color exteriorly.

43. Castor.

I. $\frac{1-1}{1-1}$; P. $\frac{1-1}{1-1}$; M. $\frac{3-3}{3-3} = 20$.

Castor, Linn. Syst. Nat., 1766, p. 78. Type. *C. fiber*, Linn.

Feet four-toed, hind feet large, webbed; upper molars subequal, with one inner and two outer enamel folds; tail broad, flat, scaly. Molars with dentinal pulp persisting to quite late in life.



FIG. 27. CASTOR CANADENSIS.
No. 88 Field Columbian Museum Coll. $\frac{1}{2}$ Nat. size

147. canadensis. (*Castor*), Kuhl. Beit. Zoöl., 1820, p. 64.

americanus? Penn., Arctic Zoöl., 1784, 1, p. 98. F. Cuv. Mam., pl. 274, 1825.

Type locality. Hudson Bay.

Geogr. Distr. Northeastern North America from northern tree limit to United States, and west to Cascade Mountains.

Genl. Char. Size smallest of American species; scaly portion of tail twice as long as wide.

Color. Winter Pelage. General color blackish brown, hairs tipped with chestnut; top and sides of head and neck, rump and thighs chestnut. Ears black. Feet, legs and under parts seal brown.

Measurements. Total length, 1130; tail vertebræ, 410; hind foot, 176; length of skull, 132, breadth, 93; length of nasals, 46, breadth, 21.4.

a.—carolinensis. (*Castor*), Rhoads, Proc. Am. Philos. Soc., 1898, p. 420.

Type locality. Dan River, near Danbury, Stokes county, North Carolina.

Geogr. Distr. North Carolina west to Louisiana.

Genl. Char. Size larger than *C. canadensis*; tail broader.

Color. Above hazel; under fur seal brown; lower part of back and rump cinnamon rufous; ears blackish; sides of head hair brown. Under parts, throat to vent broccoli brown; vent burnt umber; feet bister.

Measurements. Total length, 1130; scaly part of tail, 279 x 158; hind foot, 184. Length of skull, 148, breadth, 107; length of nasals, 43.5, breadth, 29.

b.—fondator. (*Castor*), Mearns, Proc. U. S. Nat. Mus., 1897, p. 5.

Type locality. San Pedro River, Sonora, Mexico. Near Mexican boundary monument No. 98.

Geogr. Distr. From Mexico to Wyoming and Montana, intergrading into the other forms wherever the limits of their dispersions meet.

Genl. Char. Size large; scaly portion of tail less than twice as long as wide. Skull massive; rostrum short and wide; nasals tumid.

Color. Above russet, chocolate at root of tail; grayish cinnamon to ferruginous beneath tail; sides wood brown varied with tawny olive; feet burnt sienna.

Measurements. Total length, 1070; tail vertebræ, 360; scaly portion of tail, 290 x 125; hind foot, 185. Length of skull, 133; breadth, 99.

c.—*pacificus*. (*Castor*), Rhoads, Proc. Am. Philos. Soc., 1898, p. 422.

Type locality. Lake Kichelos, Kittitass county, Washington.

Geogr. Distr. Pacific slope; California to Alaska.

Genl. Char. Size largest of species; tail long; scaly portion more than twice as long as wide. Skull with narrow long rostrum; nasal extending beyond premaxillaries.

Color. Above reddish chestnut; under fur seal brown; sides of body and legs and top of head walnut brown; under parts broccoli brown, under fur drab gray; hind feet seal brown; fore feet dark wood brown. Ears black.

Measurements. Total length, 1143; tail vertebræ, 330; scaly portion of tail, 295x122; hind foot, 185. Skull: length, 142; breadth, 101; length of nasals, 53.6, breadth, 24.

Fam. IV. **Muridae.**

Lower incisors compressed; premolars none; molars with or without roots, tuberculate, or with enameled folds; frontals contracted; jugal splint-like between zygomatic processes of the maxilla and squamosal; infraorbital vacuity wider above than below.

Sub. Fam. I. **Murinae.**

Molars rooted, tubercular; root of under incisor creating a swelling on outer side of mandible between processes of the condyle and coronoid; descending process of mandible below the plane of the molars. Palate nearly flat.

44. **Mus.**

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Mus. Linn. Syst. Nat., 1766, p. 79. Type. *Mus rattus*.

Ears large, prominent; tail long, scaly; nose acute; molars with transverse series of tubercles, three in a series, longitudinal.

148. *rattus*. (*Mus*), Linn. Syst. Nat., 1766, 1, p. 83.

Type locality. Sweden.

Geogr. Distr. Cosmopolitan.

Genl. Char. Tail little longer than head and body.

Color. Above sooty black; beneath plumbeous; feet brown.

Measurements. Total length, 368; tail vertebræ, 190.

149. *decumanus*. (*Mus*), Pall. Glir., 1778, p. 91.

Type locality. Russia.

Geogr. Distr. Cosmopolitan.

A. Epimys, Trouess. 1881.

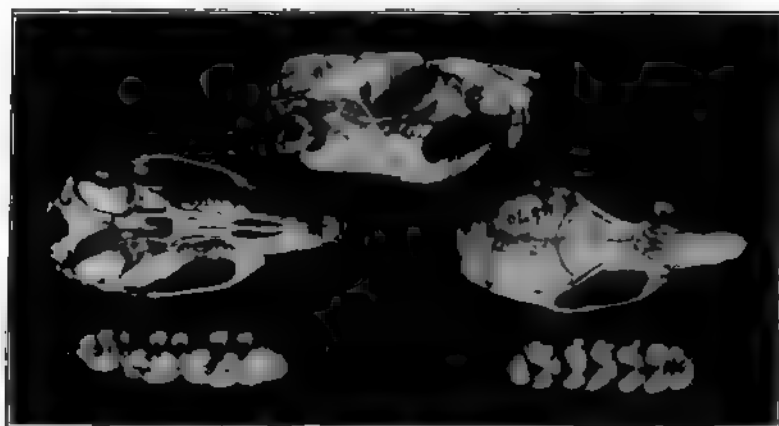


FIG. 28. MUS RATTUS.

No. 4670 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 4 times.LOWER TOOTH ROW.
Enlarged 4 times.

Genl. Char. Tail little shorter than head and body; sparsely haired; annuli about two hundred.

Color. Above rusty grayish brown; sides grayer; beneath ashy white. Tail above dusky, beneath paler.

Measurements. Total length, 310; tail vertebræ, 146; hind foot, 38.

150. *alexandrinus*. (*Mus*), Is. Geoff. Descr. Egypt, 11, p. 733, 1812, Atlas, pl. v, fig. 1.

tectorum, Savi. Nov. Giorn. di Lett., 1825.

Geogr. Distr. Cosmopolitan.

Genl. Char. Smaller than *M. decumanus*; tail considerably longer than head and body; annuli about 240.

Color. Above yellowish brown tinged with reddish; flanks grayish. Under parts and upper surface of feet, yellowish white. Tail dusky.

Measurements. Total length, 356; tail vertebræ, 198; hind foot, 35.

151. *musculus*. (*Mus*), Linn. Syst. Nat., 1766, p. 83.

Type locality. Sweden.

Geogr. Distr. Cosmopolitan.

Genl. Char. Tail longer than body; soles naked. Size small.

Color. Above grayish brown lined with blackish; beneath ashy plumbeous tinged with reddish. Tail dusky; feet ashy brown.

Measurements. Total length, 170; tail vertebræ, 83; hind foot, 18; ear, 13.5.

Sub. Fam. II. **Cricetinae.**

45. Onychomys.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Onychomys. Baird, N. Am. Mamm., 1857, p. 458. Type *H. leucogaster*, Max.

Hypudaus, Max. Reise, N. Am., 1841, 11, p. 99. (nec Auct).

"Form arvicoline; tail less than half the body in length; claws very large, fossorial, the anterior longest. Soles with only four tubercles, the two posterior of the other groups wanting; the posterior two-thirds of the soles densely furred. Skull without orbital crest; the upper margin of orbit sharp."

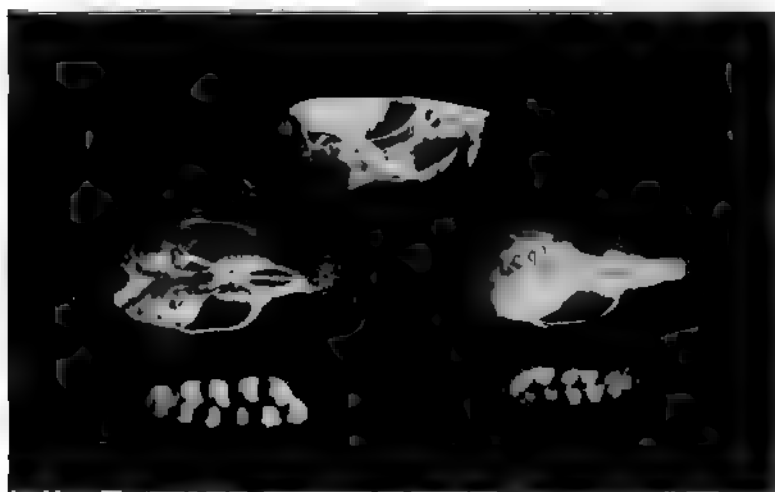


FIG. 29. **ONYCHOMYS LEUCOGASTER.**

No. 1632 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 4 times.

LOWER TOOTH ROW.
Enlarged 4 times.

153. leucogaster. (*Hypudaus*), Wied., Reis. N. Am., 1841, vol. 11, p. 99.

missouriensis, Aud. & Bach. Quad., 11, 1851, p. 327, pl. 100.

Type locality. Fort Clark, Dakota.

Geogr. Distr. Dakota, Missouri, Nebraska, Kansas, Oklahoma, Indian Territory and Texas.

Genl. Char. Fore feet very strong, hind ones smaller; tail short, thick at base, tapering rapidly to a point, and covered with short hairs.

Color. Above grayish brown lined with black, passing on the sides into a yellowish red and graduating into a line of fulvous. Under parts, feet and outside of fore leg white. Tail blackish brown for seven-eighths the length; tip and under side white.

Measurements. Total length, 160, tail, 44; hind foot, 22.5.

a.—brevicauda. (*Onychomys*), Merr., N. Am. Faun., No. 5, 1891, p. 52.

Type locality. Blackfoot, Idaho.

Geogr. Distr. Idaho, Wyoming, Colorado, northwestern New Mexico?

Genl. Char. Similar to *O. leucogaster*, but smaller with shorter tail and longer ears.

Color. Upper parts drab gray washed with pale cinnamon tawny, especially over rump and flanks. Under parts and fore legs pure white, the white reaching well up on the sides. Tail whitish with an ill-defined dark stripe on proximal two-thirds of upper surface.

Measurements. "Total length, 139; tail vertebræ, 38; hind foot, 19.5; ear from crown, 12." (Merriam, l. c.)

b.—longipes. (*Onychomys*), Merr., N. Am. Faun., 1889, No. 2, p. 1.

Type locality. Concho county, Texas.

Geogr. Distr. West central Texas.

Genl. Char. Size larger than that of the other known representatives of the genus, with larger and broader ears, and much longer hind feet: Ears less hairy than in *O. leucogaster*, with the lanuginous tuft at base less apparent; tail longer and more slender.

Color. Above mouse gray, sparingly mixed with black tipped hairs, and with a narrow fulvous stripe along each side, between the gray of the back and white of the belly, extending from the forelegs to the root of the tail; under parts white.

Measurements. Total length, 190; tail, 48; hind foot, 25; ear from crown, 13. (Dry skin.) (Merriam, l. c.)

c.—melanophrys. (*Onychomys*), Merr. N. Am. Faun., No. 2, 1889, p. 2.

Type locality. Kanab, Utah.

Geogr. Distr. Utah, range unknown.

Genl. Char. Size of *O. leucogaster*. Ear a little smaller. Hind feet furred to base of toes.

Color. Above rich tawny cinnamon, well mixed with black tipped hairs on the back, and brightest on the sides; a distinct black ring round the eye, broadest above. This ring is considerably broader and more conspicuous than the very narrow ring of *O. leucogaster*.

Measurements. Total length, 154; tail, 41; hind foot, 21. Ear from crown, 10. (Merriam, l. c.)

d.—pallenscens. (*Onychomys*), Merr. N. Am. Faun., No. 3, 1890, p. 61.

Type locality. Moki Pueblos, Apache county, Arizona.

Geogr. Distr. Northeastern Arizona.

Genl. Char. Size large, exceeded only by *O. longipes* of Concho county, Texas; ears, feet and tail much as in *O. melanophrys*; fur full, long and soft; orbital ring absent or inconspicuous; lanuginous tuft at base of ear well developed.

Color. Above pale tawny cinnamon, palest anteriorly, and brightest on the flanks and rump, not noticeably mixed with black tipped hairs. Below, white to the roots of hairs.

Measurements. Total length, 168; head and body, 125; tail, 45; hind foot, 22; ear from crown, 12; from anterior root, 16.5. (Merriam, l. c.)

153. arcticeps. (*Onychomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1898, p. 194.

Type locality. Clapham, Union county, New Mexico.

Geogr. Distr. Northeastern New Mexico.

Genl. Char. Size of *O. leucogaster*; tail longer; cranium narrow; rostrum, long, slender. Supraorbital bead wanting. Palate with convex edge posteriorly.

Color. Above ochraceous buff, lined with black; darkest on top of head and about eyes. Black spot on outer margin of ears. Sides, rump and thighs ochraceous buff; beneath tawny white. Tail white, on upper proximal third a narrow stripe of blackish buff.

Measurements. Total length, 150; tail vertebræ, 45; hind foot, 21; ear from crown, 11.

154. longicaudus. (*Onychomys*), Merr. N. Am. Faun., No. 2, 1899, p. 2.

Type locality. St. George, Utah.

Geogr. Distr. Utah, range undetermined.

Genl. Char. Similar to *O. leucogaster*, but smaller, with longer and slenderer tail. Pelage longer but not so dense.

Color. Cinnamon fawn, well mixed with black tipped hairs.

Measurements. Total length, 145; tail, 55; hind foot, 20; ear from crown, 10.

155. ramona. (*Onychomys*), Rhoads, Am. Natur., 1893, p. 833.

Type locality. San Bernardino Valley, California.

Geogr. Distr. Southeastern California.

Genl. Char. Larger than *O. torridus*, with larger ears.

Color. Similar to *O. longicaudus*. Above grayish vinaceous buff; dorsal part darker; beneath white. Tail bicolor, dark above, lighter below.

Measurements. Total length, 147; tail vertebræ, 48; hind foot, 18; ear, 12.

156. torridus. (*Onychomys*), Coues, Proc. Acad. Nat. Scien. Phil., 1874, p. 183.

Type locality. Camp Grant, Arizona.

Geogr. Distr. Between Mississippi River and Rocky Mountains. Upper Missouri, Red River of the North, Wyoming, Kansas, Arizona.

Genl. Char. Similar to *O. leucogaster*, tail longer; ears longer; colors more yellowish.

Color. General color more yellowish than *O. leucogaster*, no dorsal stripe, feet and under parts tawny white. Tail above dusky, beneath white.

Measurements. Total length, 143; tail vertebræ, 50; hind foot, 20; ear, 18.

a.—arenicola. (*Onychomys*), Mearns, Proc. U. S. Nat. Mus., vol. xix, 1897, p. 139.

Type locality. Rio Grande, near El Paso, Texas.

Geogr. Distr. Northwestern Texas.

Genl. Char. Similar to *O. torridus*, but slightly smaller, with relatively smaller ears and a very much paler coloration.

Color. Above drab gray, inclining to fawn color on sides; dorsals area with very little admixture of black-edged or black-tipped hairs, with a conspicuous tuft of white hairs at anterior base of ears; dark spot on anterior band of ear, drab (not black); whiskers more white than black; under parts, feet and end of tail white; basal two-thirds of upper side of tail drab, some of the hairs with hoary tips.

Measurements. Total length, 137; tail vertebræ, 53 (to end of pencil, 57); hind foot, 21. Skull, 25.5 by 13.5. (Mearns, l. c.)

b.—prepallidus. (*Onychomys*), Mearns, U. S. Nat. Mus., vol. xix, 1897, p. 140.

Type locality. Colorado River at Monument No. 204, Mexican boundary line.

Geogr. Distr. Gila City, across Yuma and Colorado Deserts to Coast Range of mountains.

Genl. Char. Larger than *O. torridus*, with relatively larger ears, longer tail and a much paler coloration.

Color. Above drab-gray, becoming more cinereous anteriorly; sides and rump barely tinged with fawn color; dusky line on basal

three-fourths of tail much obscured by whitish hairs, nearly obsolete; ears less densely clothed than in the remaining forms of *O. torridus*, and without a well defined dusky spot; whiskers mostly white or colorless; under parts, feet and end of tail, white.

Measurements. Total length, 157; tail vertebræ, 57; ear from crown, 16; hind foot, 22; skull, 26 by 13.7. (Mearns, l. c.)

157. fuliginosus. (*Onychomys*), Merr., N. Am. Faun., No. 3, 1890, p. 60.

Type locality. Tank lava beds, northeast of San Francisco Mountain, Arizona.

Geogr. Distr. Painted Desert and high mesas, northeastern Arizona.

Genl. Char. Size rather large; tail and hind feet short; ears rather large with lanuginous tufts at base scantily developed; pelage coarser than in the *O. melanophrys* group.

Color. Above blackish slate, darkest along the middle of the back, faintly tinged with fulvous on the sides; under parts white, the hairs of the belly plumbeous at base. Tail dusky above, except the terminal fourth which is whitish like the under side; a ring of dusky surrounds the base of the tail. The color of the upper parts is more extended than in any of the known forms. It completely covers the sides, coming down to the belly, from which it is separated by a very sharp line of demarcation; it also completely covers the posterior and outer aspects of the hind legs to the ankles, where it ends abruptly.

Measurements. Total length, 160; tail vertebræ, 47; hind foot, 21.5. Ear from crown, 12.5; ear to anterior root, 16. (Merriam, l. c.)

46. *Peromyscus.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Peromyscus. Gloger, Handb. und Hilfsb. Naturgeschichte, 1842, p.

95. Type. *Cricetus myoides*, Gapper; = *P. americanus*, Kerr.

Calomys. Aud. & Bach., Quad. N. Am., 1851, 11, p. 303 (nec. Waterh. P. Z. S., 1837, p. 21.).

Vesperimys. Coues, Proc. Acad. Nat. Scien. Phil., 1874, p. 178.

Baiomys. True, Proc. U. S. Nat. Mus., 1894, 16, p. 758.

Trinodontomys. Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 257.

Size moderate, eyes rather prominent; face rather long, nose pointed. Ears thin, rather rounded, in some species very large.

* The members of this genus require a very careful and strict revision, for many of them probably should more properly grace the list of synonyms than hold a specific or sub-specific rank.

Feet small, digits slender, palms naked. Hind feet long, soles with six tubercles. Tail terete, tapering, slender, hairy, sometimes longer than head and body and occasionally tufted. Pelage soft, frequently glossy. Skull thin, papery; brain case broad, rather flat; superior outline curving both ways from highest point just behind orbits. Zygomata slender, thread-like and dip midway to level of the palate. Arch composed mainly of processes of the maxillary and squamosal; orbital foramina just above the level of the alveolus. Interorbital constriction considerable, but wider than nostrum. Nasals and intermaxillaries project beyond the incisors. Auditory bullae small, thin, and obliquely situated. Lower jaw straight, coronoid very short. Molar series short, narrow, the teeth decreasing in size from front to rear. Upper molars with three roots each, lower with two; the unworn teeth have a double series of conical tubercles, which gradually are reduced by abrasion and the pattern varies constantly.



FIG. 30. PEROMYSCUS AMERICANUS.

No. 3644 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW
Enlarged 6 times.

UPPER TOOTH ROW
Enlarged 6 times.

158. americanus. (*Mus agrarius*), Kerr., Anim. King., 1, 1792, p. 231.
leucopus. Rafin. Am. Month. Mag., 1818, vol. 111, p. 446.

Type locality. Tennessee, or Kentucky?

Geogr. Distr. New Jersey to South Carolina, east to Mississippi, north to Minnesota.

Genl. Char. Larger than domestic mouse. Tail nearly as long as body; soles hairy.

Color. Above and sides pale yellowish brown; dorsal area darker, sometimes nearly black, outer surface of hind legs like back; rest of

pelage white. Tail, above like dorsal stripe, below white. Feet white.

Measurements. Total length, 168; tail vertebræ, 74; hind leg, 21.

a.—noveboracensis. (*Mus*), Fischer, Syn. Mamm., 1829, p. 318.

myoides. (*Cricetus*), Gapper, Zool. Journ., 1830, 5, p. 204.

myodes! (*Peromyscus leucopus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1897, p. 27.

Type locality. "In Novo Eboraco."

Geogr. Distr. From Lake Simcoe, Ontario, and Digby, Nova Scotia, south through New York, except in the boreal area of that State.

Genl. Char. Similar to *P. americanus*, dorsal stripe darker, and narrower; and tail more hairy.

Color. Like *P. americanus*, but the colors are brighter and the dorsal stripe is usually narrower and darker, being occasionally quite black. Tail bicolor, above black, beneath white.

Measurements. Total length, 178; tail vertebræ, 76; hind foot, 20. Specimen from Hastings, New York.

b.—deserticolus. (*Hesperomys*), Mearns, Bull. Am. Mus. Nat. Hist., 11, 1890, p. 285.

Type locality. Mojave Desert, California.

Geogr. Distr. Desert region of Arizona and California.

Genl. Char. Ears medium; tail long; pelage short.

Color. Above pale cinereous drab, slightly darker on median line, light fulvous on sides and rump; tail narrowly striped above with dark brown.

Measurements. Total length, 168; tail 78.7; hind foot, 20.8.

c.—sonoriensis. (*Hesperomys*), Le Conte, Proc. Acad. Nat. Scien. Phil., 1853, p. 413.

Type locality. Santa Cruz, Sonora; near boundary line of Mexico and United States.

Geogr. Distr. Arctic regions to Mexico west of Rocky Mountains.

Genl. Char. Medium, tail short, colors pale.

Color. Above dark cinereous, mixed with brownish gray; under parts whitish; feet brownish white. Tail, above dark brown, beneath paler.

Measurements. Total length, 166; tail vertebræ, 69; hind foot, 21.5; ear, 20.

d.—arizonæ. (*Sitomys*), Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 321.

Type locality. Fairbank, Arizona.

Geogr. Distr. Mountains of Arizona, White, Chiricahua and Graham Ranges.

Genl. Char. Similar to *P. gambeli*, but smaller, longer ears and shorter tail.

Color. Above dark plumbeous slate; below whitish. Tail bicolor.

Measurements. Total length, 158; tail vertebræ, 67; hind foot, 24.

e.—artemesiae. (*Sitomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 260.

Type locality. Ashcroft, British Columbia.

Geogr. Distr. Southern Idaho, Western Washington and Oregon to British Columbia.

Genl. Char. Size large. Tail short, hardly equaling body without head. Ears medium.

Color. Above tawny ash, darkest on median line and inclining to fulvous on sides and rump. Under parts white; tail, above sooty, beneath white.

Measurements. Total length, 170; tail vertebræ, 70; hind foot, 20.

159. tornillo. (*Peromyscus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1895, p. 445.

Type locality. Rio Grande six miles above El Paso, Texas.

Geogr. Distr. Northern Texas, range not known.

Genl. Char. "Similar to *P. a. arizonæ*, but paler, ears smaller, body stouter." (Mearns, l. c.)

Color. Above light broccoli brown; feet and under parts pure white; tail bicolor.

Measurements. Total length, 192; tail vertebræ, 90; hind foot, 23; ear, 12.

160. rufinus. (*Hesperomys*), Merr., N. Am. Faun., No. 3, 1890, p. 65, pl. 3.

Type locality. San Francisco Mountain, Arizona.

Geogr. Distr. Northwestern Arizona to New Mexico, Utah and Colorado.

Genl. Char. Similar to *P. americanus*, but with larger ears and shorter tail.

Color. Above tawny brown, darkest on dorsal region; flanks brighter brown; remaining parts white. Tail dusky above, whitish below.

Measurements. Total length, 168; tail vertebræ, 69; hind foot, 19.

161. gossypinus. (*Hesperomys*), Le Conte, Proc. Acad. Nat. Scien. Phil., 1853, p. 411.

cognatus, Le Conte, Proc. Acad. Nat. Scien. Phil., 1855, p. 442.

megacephalus, Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 254.

Type locality. Riceboro, Liberty county, Georgia.

Geogr. Distr. North Florida to Bertie county, North Carolina; west to Alabama and Mississippi.

Genl. Char. Tail shorter than head and body; size of body large; hind foot large.

Color. Above dark brown; much darker on median line; orbital ring black. Beneath smoke gray; feet grayish white. Tail dusky above, grayish white below.

Measurements. Average total length, 177.66; tail vertebræ, 70.25; hind foot, 22.35.

a.—mississippiensis. (*Peromyscus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1896, p. 189.

Type locality. Samburg, Redfoot Lake, Tennessee.

Geogr. Distr. Mississippi bottoms in Tennessee; range unknown.

Genl. Char. Similar in size to *P. gossypinus*; tail longer; hind foot larger; colors paler; dorsal band less marked.

Color. Above from cinnamon brown to russet; middle of back darker; under parts grayish white; tail dusky above, white below; feet grayish white.

Measurements. Average total length, 183; tail vertebræ, 79.5; hind foot, 24.45.

b.—palmarius. (*Peromyscus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 124.

Type locality. Oak Lodge, Brevard county, Florida.

Geogr. Distr. Peninsular Florida.

Genl. Char. Similar to *P. gossypinus*; hind foot shorter; colors paler; no defined dorsal band.

Color. Above bright russet to wood brown; orbital ring black; under parts grayish white. Tail dusky above; white below. Feet grayish white.

Measurements. Average total length, 181; tail vertebræ, 71.88; hind foot, 21.55.

c.—nigriculus. (*Peromyscus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 124.

Type locality. Burbridge, Plaquemines Parish, Louisiana.

Geogr. Distr. Bayou region, Louisiana coast.

Genl. Char. Small; colors very dark.

Color. Above vandyke brown to sepia; dorsal band almost black; a black orbital ring; under parts grayish white, base of hairs plumbe-

ous; ears black. Tail black above, grayish white below; feet grayish white.

Measurements. Average total length, 168.33; tail vertebræ, 76.66; hind foot, 22.

162. anastasiae. (*Peromyscus*), Bangs, Proc. Bost. Soc., 1898, p. 195.

Type locality. Point Romo, Anastasia Island, Florida.

Geogr. Distr. Anastasia Island, Florida.

Genl. Char. Size small, colors pale.

Color. Above brown mixed with buffy; cheeks and lower sides buff; beneath grayish white; tail above at base buff; rest dusky; beneath white; feet white; ears dusky.

Measurements. Total length, 165; tail vertebræ, 69.5; hind foot, 21; ear, 16.5.

163. insulanus. (*Peromyscus*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 196.

Type locality. Cumberland Island, Georgia.

Geogr. Distr. Cumberland, and Ossabaw (?) Islands, Georgia.

Genl. Char. Size small; tail short; hind foot large.

Color. Above drab, or yellowish drab, darkest on dorsal region; beneath white; tail dull gray above, white below. Feet white; ears dusky.

Measurements. Total length, 168; tail vertebræ, 68; hind foot, 22; ear from notch, 17.

164. canadensis. (*Pitomys*), Miller, Proc. Biol. Soc. Wash., 1893, p. 55.

gracilis? Le Conte, Proc. Acad. Nat. Scien, 1855, p. 442.

myoides, Baird, N. Am. Mamm., 1857, p. 472.

Type locality. Peterboro, Madison county, New York.

Geogr. Distr. Spruce forest of New Brunswick, south to central New York and western Massachusetts.

Genl. Char. Larger than *P. americanus*; longer, more hairy tail, and less russet coloration.

Color. Above wood brown, tinged with yellow; under parts whitish; tail vandyke brown above; whitish beneath.

Measurements. Total length, 200; tail vertebræ, 100; hind foot, 21.4.

a.—abietorum. (*Peromyscus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 49.

Type locality. James River, Nova Scotia.

Geogr. Distr. Nova Scotia, range not defined.

Genl. Char. Similar to *P. canadensis*, but color uniform.

Color. Uniform dark smoke gray above, darker along median line; under parts and feet white; tail black above, white below.

Measurements. Total length, 200; tail, 103; hind foot, 20.

b.—umbrinus. (*Peromyscus*), Miller, Proc. Bost. Soc. Nat. Hist., 1897, p. 23.

Type locality. Peninsula Harbor, northwestern extremity of Lake Superior, Ontario.

Geogr. Distr. Not determined.

Genl. Char. Smaller than *P. canadensis*, but the proportions similar; skull more slender, rostrum lighter and longer, and the zygomata less flaring.

Color. Back and sides light yellowish brown, suffused with black, darkest on median line of back; orbital ring and patch at base of whiskers black; ears nearly black; tail well haired, black above, white beneath; under parts and feet white.

Measurements. Average total length, 175; tail vertebræ, 88.2; hind foot, 19.2; ear, 17.6.

c.—nubiterræ. (*Peromyscus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1896, p. 187.

Type locality. Roan Mountain, Mitchell County, North Carolina.

Geogr. Distr. Summits of Southern Alleghanies?

Genl. Char. Smaller than *P. americanus*; tail longer, color darker.

Color. Above cinnamon, with median black stripe from crown to root of tail. Beneath white, base of hairs sooty. Ears dusky. Space around eyes sooty. Tail above sooty brown, below white.

Measurements. Total length, 170; tail vertebræ, 87; hind foot, 20.5.

165, akeleyi. (*Peromyscus*), Elliot, Pub. Field Columb. Mus., 1899, 1, p. 253. Zoölogy.

Type locality. Johnson's Ranch, Elwah River, Clallam County, Washington.

Geogr. Distr. Region of Olympic Mountains, Washington.

Genl. Char. Boylii group, but of smaller size; ears smaller; tail shorter.

Color. Above brownish fulvous; brightest on flanks; dorsal area darker; legs, feet and under parts pure white. Ears nearly naked, purplish brown; indistinct black orbital ring. Tail above dark brown, below white.

Measurements. Total length, 185; tail vertebræ, 99; hind foot, 21; ear, 15.

166. texensis. (*texanus!*. *Hesperomys*), Woodh., Proc. Acad. Nat. Scien. Phil., 1853, p. 242.

Type locality. Rio Grande near El Paso, Texas.

Geogr. Distr. Texas, New Mexico, Oklahoma and Indian Territories.

Genl. Char. Small, tail equal to head and body; ears small.

Color. Above cinereous mixed with pale brown; lower sides, feet and under parts white. Tail above brown, beneath white.

Measurements. Total length, 117; tail vertebræ, 53; hind foot, 44; ear, 9.

a.—medius. (*Peromyscus*), Mearns, Proc. U. S. Nat. Mus., 1895, p. 446.

Type locality. Nachoguero Valley, Lower California.

Geogr. Distr. Southern and Lower California.

Genl. Char. Paler than *P. gambeli* and smaller; ear larger; tail shorter.

Color. Above wood brown, darker on dorsal tract, mixed with black, shading to russet on flanks; feet and under parts pure white; tail above white on sides and beneath.

Measurements. Total length, 160; tail vertebræ, 70; hind foot, 21; ear, 17.

b.—clementis. (*Peromyscus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1895, p. 446.

Type locality. San Clemente Island, California.

Geogr. Distr. From type locality only.

Genl. Char. Much blacker than *P. t. medius*, and of a more reddish coloration, save on the head.

Color. Top of head drab gray; upper parts drab tinged with burnt umber; ears black; feet and under surface white; tail bicolor.

Measurements. Total length, 177; tail vertebræ, 77; hind foot, 21; ear 17.

c.—gambeli. (*Hesperomys*), Baird, N. Am. Mamm., 1857, p. 464.

Type locality. Monterey, California.

Geogr. Distr. California, Nevada, Oregon and Washington.

Genl. Char. Ears large; tail shorter than body.

Color. Above yellowish brown; flanks paler; under parts and feet white; tail bicolor; dusky above, white below.

Measurements. Total length, 163; tail vertebræ, 77; hind foot, 18.

d.—nebracensis. (*Hesperomys*), Mearns, Bull. Am. Mus. Nat. Hist., 1890, p. 287.

Type locality. Custer County, Montana.

Geogr. Distr. The Dakotas, Montana, Wyoming, Nebraska and Kansas.

Genl. Char. Size rather large; tail short, pelage long.

Color. Above grayish fulvous, lined with black; white patch in front of ear; under parts white. Tail above black, rest white.

Measurements. Total length, 159; tail to end of hairs, 66; hind foot, 20.

e.—saturatus. (*Peromyscus*), Bangs, Am. Nat., 1897, p. 75.

Type locality. Saturna Island, British Columbia.

Geogr. Distr. Saturna Island, British Columbia. Range not determined.

Genl. Char. Size as in *P. t. gambeli*; color darker.

Color. Above sepia brown, mixed with sooty black, paler on sides; indistinct lateral cinnamon band; under parts grayish white; orbital ring black, ears black. Tail black above, white below; feet white.

Measurements. Average total length, 180.95; tail vertebræ, 76.20; hind foot, 21.25.

f.—arcticus. (*Hesperomys*), Mearns, Bull. Am. Mus. Nat. Hist., 1889, p. 285.

Type locality. Fort Simpson, Hudson Bay.

Geogr. Distr. Hudson Bay to Rocky Mountains, Arctic America.

Genl. Char. Tail long, ears medium; pelage long and dense.

Color. Above dark grayish brown, mixed with black on median line; feet and under parts white; no white spot at base of ear. Tail, bicolor, black on top, white below.

Measurements. Average total length, 160; tail vertebræ, 73.5; hind foot, 20.3.

g.—subarcticus. (*Peromyscus*), Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 15.

Type locality. Deerlodge County, Montana.

Geogr. Distr. From Utah and Colorado, through Wyoming, the Dakotas and Montana to the Saskatchewan Valley, Alberta.

Color. Above dusky brown, tinged with pale fulvous, blackish on median line; fulvous on flanks; feet and under parts white. Tail, above blackish brown, sides and beneath white.

Measurements. Total length, 165; tail vertebræ, 66; hind foot, 19.

167. maniculatus. (*Hesperomys*) Wagn. Archiv. Naturg., xi, 1845, p. 148. Bangs, Am. Nat., 1898, p. 496.

Type locality. Moravian Settlements in Labrador.

Geogr. Distr. Labrador, limits not determined.

Genl. Char. Skull large, broad, brain case flat; rostrum heavy.

Color. "Supra fuliginoso-bruneus, subtus abrupte albus; auriculis elongatis; pedibus albens; cauda supra nigra, infra abrupte albida."

Measurements. "Körper 3" 2"; Schwanz 2" 5"." "Total length, 166; tail vertebræ, 74; pencil, 5; hind foot, 19.5." (Bangs.)

168. austerus. (*Hesperomys*), Baird, Acad. Nat. Scien. Phil., 1855, p. 336.

Type locality. Spokane Plain, Washington. Exact locality not named.

Geogr. Distr. Pacific Coast, California to Washington.

Genl. Char. Smaller than *P. americanus*, feet smaller.

Color. Sooty brown, tinged with yellowish brown on cheeks and sides; feet and under parts white; tail above blackish, beneath white.

Measurements. Total length, 151; tail vertebræ, 70; hind foot, 19.

169. mearnsi. (*Vesperimus*), Allen, Bull. Am. Mus. Nat. Hist., 1891, p. 300.

Type locality. Brownsville, Texas.

Geogr. Distr. Texas to Arizona.

Genl. Char. Ears large, naked. Fawn spot on breast; tail less than head and body.

Color. Above dusky grayish brown tinged with fawn; flanks fawn; beneath pure white. A pale fawn spot on the center of the breast. Ears dusky, edged with white. Tail, dusky gray above, lighter beneath. Feet grayish white.

Measurements. Average total length, 178.6; tail vertebræ, 80; ear, 13; hind foot, 20.8.

170. canus. (*Peromyscus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1895, p. 445.

Type locality. Fort Clark, Kinney County, Texas.

Geogr. Distr. Texas and Oklahoma Territory.

Genl. Char. Similar to *P. mearnsi*, but smaller, tail shorter.

Color. Above drab gray, median line blackish; feet and under parts pure white. Tail, blackish above, white below.

Measurements. Total length, 175; tail vertebræ, 75; hind foot, 21; ear, 11.5.

171. boylii. (*Hesperomys*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 355.

gilberti, Allen, Am. Mus. Nat. Hist., 1893, p. 188.

Type locality. American River, Eldorado County, California.

Geogr. Distr. Central and eastern California.

Genl. Char. Body stout; ears very large; tail longer than the body.

Color. Above mixed glossy brown and pale yellowish brown; feet and lower parts white; white on sides bordered by a line of reddish buff, which grades into the color of the upper parts. Tail, above dusky, beneath white.

Measurements. Total length, 228; tail vertebræ, 97; hind foot, 22.

α.—penicillatus. (*Peromyscus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1896, p. 139.

Type locality. Franklin Mountains, near El Paso, Texas.

Geogr. Distr. Northwestern Texas.

Genl. Char. Nasal bones of skull truncate posteriorly, and ending in front of the posterior ends of premaxillaries.

Color. Above drab gray tinged with ochraceous buff on rump and sides. Feet and under parts pure white. Tail, dusky drab above, white below.

Measurements. Total length, 202; tail vertebræ, 115; hind foot, 22; ear, 14.

172. keeni. (*Sitomys*), Rhoads, Proc. Acad. Scien. Phil., 1894, p. 258.

Type locality. Queen Charlotte Island, British Columbia.

Geogr. Distr. Type locality only, so far as known.

Genl. Char. Size larger than *P. austerus*; ears smaller; tail more than head and body in length. Skull: brain case inflated above plane of orbits.

Color. Above uniform grizzled blackish brown; feet and lower parts ashy white; orbital ring and ears, sooty black. Tail, above sooty black; below whitish.

Measurements. Total length, 170; tail vertebræ, 88; hind foot, 24; ear, 10.5.

173. macrorhinus. (*Sitomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 259.

Type locality. Skeena River, British Columbia.

Geogr. Distr. British Columbia, south, possibly into northern Washington.

Genl. Char. Tail longer than head and body; feet large; ears medium; rostrum relatively very long, longer than post-orbital region, *i. e.*, from greatest constriction to frontals.

Color. Resembles *P. keeni*, but grayer and lighter above. Tail more coarsely haired, and with a pencil.

Measurements. Total length, 210; tail vertebræ, 112; hind foot, 20; ear, 15.

174. sitkensis. (*Peromyscus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 223.

Type locality. Sitka, Alaska.

Geogr. Distr. Baranof Island, Alaska.

Genl. Char. Size large; tail long; ears small; colors dark.

Color. Above brown, russet on rump; orbital ring dusky; feet and under parts white. Tail blackish above, white below.

Measurements. Total length, 222; tail vertebræ, 112; hind foot, 26.

175. oreas. (*Peromyscus*), Bangs, Biol. Soc. Wash., 1898, p. 84.

Type locality. Mt. Baker Range, British Columbia.

Geogr. Distr. Higher mountains of northern Washington and southern British Columbia.

Genl. Char. Size medium; tail long; skull with brain case broad and flat, and rostrum long and slender.

Color. Above varying from Prout's brown to russet, median line darkest; orbital ring black; feet and under parts white. Tail black above, white below; pencil long.

Measurements. Total length, 200; tail vertebræ, 101; hind foot, 24.

176. auripectus. (*Sitomys*), Allen, Bull. Am. Mus. Nat. Hist., 1893, p. 75.

Type locality. Bluff City, Southeastern Utah.

Geogr. Distr. Utah, Arizona and New Mexico.

Genl. Char. Size of *P. sonoriensis*, ears larger; tail longer, thickly clothed with hairs; general color paler. Cheek pouches rather large.

Color. Above pale yellowish brown, varied with blackish on median line; flanks golden brown; under parts white. Tail pale brown above, white beneath with a yellowish brown pectoral spot. Ears pale brown, edged with white. Indistinct orbital ring.

Measurements. Total length, 172; tail vertebræ, 93; hind foot, 22; ear, 16.

177. rowleyi. (*Sitomys*), Allen, Bull. Am. Mus. Nat. Hist., 1893, p. 77.

Type locality. Nolan's Ranch, Utah.

Geogr. Distr. Utah to Arizona.

Genl. Char. Similar to *P. auripectus*, but larger. No pectoral spot; soles naked.

Color. Above pale grayish cinnamon brown, varied with black, and passing into yellowish cinnamon on flanks; beneath white. Tail pale brown above, whitish below. Ears large, naked.

Measurements. Total length, 201; tail vertebræ, 106; hind foot, 23; ear, 15-18.

a.—pinalis. (*Sitomys*), Miller, Bull. Am. Mus. Nat. Hist., 1893, p. 331.

Type locality. Granite Gap, Grant County, New Mexico.

Geogr. Distr. New Mexico and Arizona.

Genl. Char. Smaller than *P. rowleyi*; more yellowish in color.

Color. Above olive buff, darker on sides and grayer on head and face, hairs sepia tipped; indistinct orbital ring; feet and under parts pure white. Tail brown above, white beneath.

Measurements. Total length, 196; tail, 104; hind foot, 23; ear, 20.

178. attwateri. (*Peromyscus*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 330.

Type locality. Turtle Creek, Kerr County, Texas.

Geogr. Distr. Indian Territory, Texas.

Genl. Char. Ears large; tail longer than body and head.

Color. Above tawny brown, mixed with black on the median line; flanks golden with a pronounced lateral line. Beneath pure white. Feet white. Tail dusky above, grayish below, haired, and tip tufted. Ears naked, dusky, edged with white.

Measurements. Total length, 216; tail vertebræ, 110; hind foot, 23; ear, 17.

179. bellus. (*Peromyscus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 137.

Type locality. Stilwell, Indian Territory.

Geogr. Distr. Only known from type locality.

Genl. Char. Size as *P. attwateri*, but with darker and browner colors. Tail hairy and tufted.

Color. Above broccoli brown, mixed with black on median line; fawn color on lower sides; feet and under parts white, base of hairs plumbeous. Across neck beneath is a fawn-colored band. Tail black above, white below. Ears large, dusky.

Measurements. Total length, 190; tail vertebræ, 190; hind foot, 24; ear, 17.

180. insolatus. (*Sitomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 256.

Type locality. Oro Grande, Mojave Desert, Kern County, California.

Geogr. Distr. Mojave Desert, California, limit of range not determined.

Genl. Char. Very small; tail shorter than body without head

feet very short; nasals wide and bluntly edged between the nasal premaxillary processes.

Color. Above uniform grayish ochre; under parts and feet white. Tail dusky above, white below.

Measurements. Total length, 158; tail vertebræ, 76; hind foot, 19.3; ear, 12.

181. fraterculus. (*Vesperimus*), Miller, Amer. Nat., 1892, p. 261.

Type locality. Dulzura, San Diego, California.

Geogr. Distr. Southern California, range not determined.

Genl. Char. Size medium; tail longer than head and body, thinly haired; soles naked; ears large.

Color. Above yellowish wood brown mixed with black, darkest on median line; flanks fulvous with distinct lateral stripe; feet white; under parts yellowish white with fulvous pectoral spot. Tail, above brownish, paler beneath.

Measurements. Total length, 185; tail vertebræ, 113; hind foot, 20; ear, 18.

182. eremicus. (*Hesperomys*), Baird, Mamm., N. Am., 1857, p. 479.

Type locality. Colorado Desert.

Geogr. Distr. New Mexico, Arizona and California.

Genl. Char. Ears very large; tail longer than the head and body; palms and soles naked.

Color. Above pale yellowish gray, mixed with black; pale fulvous band on cheeks and sides. Tail, obscurely bicolor, above little darker than dorsal region. Feet whitish.

Measurements. Total length, 190; tail vertebræ, 96.5; hind foot, 22; ear, 19.

a.—arenarius. (*Peromyscus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1896, p. 138.

Type locality. Rio Grande, near El Paso, Texas.

Geogr. Distr. Northern Texas, limits of range unknown.

Genl. Char. Similar to *P. eremicus*, without dark, dorsal line.

Color. Above and sides pale ochraceous drab mixed with black; tail above dusky drab and hoary, below pure white. Head grayish; orbital ring dusky.

Measurements. Total length, 198; tail vertebræ, 106; hind foot, 21.5; ear, 15.

183. stephensi. (*Peromyscus*), Mearns, Proc. U. S. Nat. Mus., 1897, p. 72.

Type locality. San Diego County, California, near Mexican boundary.

Geogr. Distr. Southern California.

Genl. Char. Similar to *P. eremicus*, but smaller, tail longer, and colors paler.

Color. Above grayish cream buff, sides and rump pale ochraceous buff, feet and under parts white. Tail, above dusky, below white.

Measurements. Total length, 193; tail vertebræ, 108; hind foot, 19; ear, 18.5.

184. major. (*Sitomys*), Rhoads, Amer. Natur., 1893, p. 831.

Type locality. Squirrel Inn, San Bernardino County, California.

Geogr. Distr. Southern California, range not determined.

Genl. Char. Size large; tail equal in length to head and body; hind feet small; ears large.

Color. Above pale grayish buff, brownish on rump; sides buffy; beneath grayish white, no lateral stripe. Orbital ring black.

Measurements. Total length, 193.5; tail vertebræ, 98.5; hind foot, 22.5.

185. herroni. (*Sitomys*), Rhoads, Amer. Natur., 1893, p. 832.

Type locality. San Bernardino Valley, California.

Geogr. Distr. Southern California.

Genl. Char. Body short, stout; tail long, slender; longer than head and body; rather naked.

Color. Above uniform buffy gray; cheeks and flanks ochraceous buff; feet and lower parts, white. Face gray.

Measurements. Total length, 200; tail vertebræ, 155; hind foot, 21. Skull: total length, 24.5; basilar length, 18.5; zygomatic breadth, 12.3; nasals, 9.2; interorbital constriction, 3.5.

a.—nigellus. (*Sitomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 257.

Type locality. Cajou Pass, San Bernardino Range, California.

Geogr. Distr. Southern California in high mountains.

Genl. Char. Similar to *P. herroni*, but colors darker.

Color. Like *P. herroni*, but the buffy gray is deeply lined with black, darkest on posterior portion of body, cheeks and sides deep fawn; under parts pure white. Ears and tail much darker than in the allied species.

Measurements. Total length, 197; tail vertebræ, 114; hind foot, 22. Skull: basilar length, 19; zygomatic width, 12.7; length of nasals, 9.2; of mandible, 13.1.

186. californicus. (*Mus*), Gambel, Proc. Acad. Nat. Scien. Phil., 1848, p. 78.

Type locality. Monterey, California.

Geogr. Distr. Coast region of California.

Genl. Char. Size large, tail long; ears large, sparsely haired.

Color. Above dark gray mixed with light brown; sides fulvous; under parts grayish buff. Tail, blackish brown above, whitish below.

Measurements. Total length, 265; tail vertebræ, 142; hind foot, 28; ear, 26.

187. insignis. (*Peromyscus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1895, p. 33.

Type locality. Dulzura, San Diego County, California.

Geogr. Distr. Southeastern California.

Genl. Char. Size large; tail very long, exceeding head and body.

Color. Above light brownish gray, mingled with black, darkest on back; brownest on rump and thighs; flanks ochraceous; feet and under surface grayish white. Tail above sooty, below grayish white.

Measurements. Total length, 233; tail vertebræ, 132; hind foot, 26; ear, 23.

188. dyselius. (*Peromyscus*), Elliot, Pub. Field Columb. Mus., 1898, 1, p. 207, Zoölogy.

Type locality. Partola, San Mateo County, California.

Geogr. Distr. Coast region of California south of San Francisco.

Genl. Char. Similar to *P. californicus*, but smaller; skull with frontals considerably restricted at orbits and palate narrow.

Color. Above black interspersed with buff; head and neck grayish buff; flanks pale buff with a lateral line of bright buff; orbital ring black. Under parts white, with a fulvous spot on breast of the majority of specimens. Tail long as head and body, hairy and tufted, dark brown above, yellowish white beneath. Ears large, black. Feet and legs grayish white sometimes tinged with buff.

Measurements. Total length, 193; tail vertebræ, 101; hind foot, 26; ear, 23.5.

189. robustus. (*Sitomys*), Allen, Bull. Am. Mus. Nat. Hist., 1893, p. 335.

Type locality. Mus. Stanford University, Palo Alto, California.

Geogr. Distr. Not known.

Genl. Char. Similar in color to *P. t. gambeli*, but very much larger. Ears moderate; tail shorter than head and body.

Color. Above dull yellowish brown mixed with black, darkest on median line; feet and under parts white. Tail dusky brown above, white beneath.

Measurements. Total length, 174; tail, 73; hind foot, 21; ear, 19.

190. floridanus. (*Hesperomys*), Chapman, Bull. Amer. Mus. Nat. Hist., 1889, p. 117.

macropus, Merr., N. Am. Faun., No. 4, 1890, p. 53.

Type locality. Gainesville, Florida.

Geogr. Distr. Florida Peninsula.

Genl. Char. Size large; ears large; tail half as long as head and body.

Color. Above buffy ochraceous, dorsal area darker; flanks fulvous; under parts and feet white; tail bicolor; dusky above, white beneath, sparsely haired.

Measurements. Total length, 161-210; tail, 84-96; hind foot, 24-29; ear, 18-21.

191. megalotis. (*Hesperomys*), Merr., N. Am. Faun., No. 3, 1890, p. 64, pls. 3, 4.

Type locality. Black Tank, Desert of the Little Colorado, Arizona.

Geogr. Distr. Desert of the Little Colorado, Arizona.

Genl. Char. Size large, ears large, tail long.

Color. Above yellowish brown, suffused with reddish brown; sides washed with tawny salmon; ears, orbital ring and tail above dusky; under parts of feet white. Salmon suffusion on breast.

Measurements. Total length, 200; tail vertebræ, 108; hind foot, 24; ear 21.

192. truei. (*Hesperomys*), Shufeldt, Proc. U. S. Nat. Mus. Wash., 1885, p. 407, pl. 21.

Type locality. Fort Wingate, New Mexico.

Geogr. Distr. Nevada, Utah and New Mexico.

Genl. Char. Form robust, ears very large; tail thickly haired.

Color. Above yellowish brown mixed with black, darkest on median line; sides fulvous; feet and under parts white. Tail above blackish brown, below white.

Measurements. Total length, 169; tail vertebræ, 82; hind foot, 20; ear, 25.

a.—nasutus. (*Vesperimus*), Allen, Bull. Amer. Mus. Nat. Hist., 1891, p. 299.

Type locality. Estes Park, Larimer County, Colorado.

Geogr. Distr. Colorado.

Genl. Char. Ears large, nearly naked; soles naked; tail much shorter than head and body.

Color. Above dusky suffused with pale grayish buff; sides yellowish buff, forming a distinct lateral band; under parts and feet white. Orbital ring blackish. Tail blackish above, white below.

Measurements. Total length, 190; tail vertebræ, 104.7; hind foot, 22.4; ear, 69.

b.—crinitus. (*Hesperomys*), Merr., N. Amer. Faun., No. 5, 1891, p. 53, fig. 3.

Type locality. Shoshone Falls, Snake River, Idaho.

Geogr. Distr. Idaho.

Genl. Char. Similar to *P. eremicus*, but darker; tail longer than head and body, densely haired; soles haired; ears large.

Color. Above olive brown, lined with black and suffused with ochraceous buff on the sides. Patch between fore legs and anal region ochraceous buff. Under parts white. Tail dusky above, whitish below.

Measurements. Total length, 184; tail vertebræ, 97; hind foot, 21.

193. nuttalli. (*Arvicola*), Harl., Am. Month. Journ., 1832, p. 446.

aureolus. Aud. & Bach., Jour. Acad. Nat. Scien. Phil., 1842, p. 302.

Type locality. Norfolk, Virginia.

Geogr. Distr. Southern Virginia, North and South Carolina, Georgia.

Genl. Char. Tail less than head and body; first molar with three indentations on either side; last molar with but one. (Aud. & Bach.)

Color. Above bright orange, base of fur plumbeous; beneath white, except belly which is light buff. Tail, dark brown above and below.

Measurements. Total length, 185; tail vertebræ, 78; hind foot, 21.

194. michiganensis. (*Mus*), Aud. & Bachm., Jour. Acad. Nat. Scien. Phil., 1842, p. 304.

Type locality. Erie County, Michigan.

Geogr. Distr. Indiana north to Dakota and Minnesota, west and south to Kansas.

Genl. Char. Stout; tail more than half as long as head and body; ears naked; color dark.

Color. Above mixed light brown and black, darkest on median line, a line of yellowish fawn from cheeks along the sides of the neck; tail light brown, as are also the feet and ears.

Measurements. Total length, 165; tail vertebræ, 67; hind foot, 10.5; ear, 18.5.

a.—pallescens. (*Peromyscus*), Allen, Bull. Am. Mus. Nat. Hist. N. Y., 1896, p. 238.

texanus! Allen, Bull. Am. Mus. Nat. Hist., 1896, p. 64 (nec Waterhouse).

Type locality. San Antonio, Texas.

Geogr. Distr. Texas.

Genl. Char. Similar in color to *P. canus*, but smaller; tail shorter, hind foot smaller.

Color. Above grayish brown washed with yellowish, strongest on the sides; dorsal band blackish; under parts grayish white; feet white. Tail, blackish brown, beneath white.

Measurements. Total length, 127; tail vertebræ, 51; hind foot, 10.

195. anthonyi. (*Hesperomys*), Merr., Proc. Biol. Soc. Wash., 1887, p. 5.

Type locality. Camp Apache, Grant County, New Mexico.

Geogr. Distr. New Mexico and Arizona.

Genl. Char. Small; tail longer than head and body; ears large; soles naked.

Color. Above ash gray, lined with black; sides buffy fulvous; under parts white. Tail, above dark brown; beneath whitish.

Measurements. Total length, 144; tail vertebræ, 80; hind foot, 18.5; ear, 12.

196. taylori. (*Hesperomys*), Thos., Ann. & Mag. Nat. Hist., 1887, p. 66.

Type locality. San Diego, Texas.

Geogr. Distr. Southern Texas.

Genl. Char. Similar to *P. michiganensis*, but much smaller; tail indistinctly bicolor; soles naked; dorsal area not darker than flanks.

Color. Above yellowish brown thickly lined with black; flanks same, grading into the grayish white of the under parts. Tail brown, slightly paler beneath.

Measurements. Total length, 85; tail vertebræ, 32; hind foot, 13; ear, 5. Skull: basal length, 15; greatest breadth, 9.5; nasal length, 6.5; interorbital constriction, 34; interparietal length, 2; breadth, 5.

197. niveiventris. (*Hesperomys*), Chapman, Bull. Amer. Mus. Nat. Hist., 1889, p. 117.

Type locality. Micco, Brevard County, Florida.

Geogr. Distr. Florida Peninsula, eastern part.

Genl. Char. Tail about half the length of the body and head. Size of body moderate; ears small.

Color. Above pale tawny gray, darker on median line; face and base of tail tawny; feet and legs, nose, lower half of cheeks and under parts, pure white, the hairs white to the base. Tail, brown above, white below.

Measurements. Total length, 155; tail vertebræ, 60; hind foot, 19; ear, 13.5.

- 198. phasma.** (*Peromyscus*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 199.

Type locality. Ponto Romo, Anastasia Island, Florida.

Geogr. Distr. Anastasia Island, Florida.

Genl. Char. Size of *P. niveiventris*, colors paler; nose and face white to eyes.

Color. Above pale drab; sides of rump pinkish buff; between ears drab gray; between eye and ear pinkish buff; line over eye, spot at base of ear and nose, white; beneath white to base of hairs, white encroaching high on sides; tail white, nearly hairless, legs and feet white, ears drab gray.

Measurements. Total length, 141; tail vertebræ, 54; hind foot, 19; ear from notch, 13.5.

- 199. subgriseus.** (*Sitomys*), Chapman, Bull. Amer. Mus. Nat. Hist., 1893, p. 340.

Type locality. Gainesville, Florida.

Geogr. Distr. Central Florida.

Genl. Char. Small; tail short, hind foot long; color similar to *P. niveiventris*, but dark, soles naked beneath.

Color. Above wood brown and cinnamon, mixed with black on back, forming indistinct dorsal area; feet and under parts white; tail bicolor.

Measurements. Total length, 122; tail vertebræ, 45; hind foot, 10.5; ear, 13.

- a.—rhoaulsi.** (*Peromyscus*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 201.

Type locality. Anclote River, Hillsboro County, Florida.

Geogr. Dist. Southwestern portion of Florida Peninsula.

Genl. Char. Yellower than *P. subgriseus*; hairs of under parts white to the base; tail unicolor.

Color. Above fawn color mixed with black on dorsal region; cheeks, rump and lower sides orange buff; under parts pure white. Tail white, feet white, ears yellowish.

Measurements. Total length, 124.46; tail vertebræ, 45.72; hind foot, 16.51.

- b.—baliolus.** (*Peromyscus*), Bangs, Science, 1898, p. 214.

arenarius, Bangs (nec Mearns), Proc. Bost. Soc. Nat. Hist., 1898, p. 202.

Type locality. Hursman's Lake, near Bascom, Scriven County, Georgia.

Geogr. Distr. Probably sand hill region of northern Georgia and southern South Carolina, limits not ascertained.

Genl. Char. Size of *P. subgriseus*; color darker.

Color. Above varying from hair to Prout's brown, mixed with black; dorsal region darkest; lower sides washed with fawn; orbital ring black; under parts white; tail above black, beneath white; feet white; ears blackish.

Measurements. Total length, 125; tail vertebræ, 48; hind foot, 16; ear, 18.

47. Sigmodon.

I. $\frac{1-1}{1-1}$; M. $\frac{3-3}{3-3}=16$.

Sigmodon. Say & Ord, Journ. Acad. Nat. Scien. Phil., 1825, p. 352.

Skull short and wide; length less than twice the zygomatic width; rostrum short, swollen; superior outline of skull arched; pointed process of lamellar plate of maxillary nearly dividing the lower part of the anteorbital foramen from the upper; an azygos median process on palatal arch; prominent bead on the supraorbital border extending obliquely backwards to occiput; audital bullæ small. Upper molars three rooted; front lower molar four rooted; second and third lower molars three rooted. Sometimes minute accessory fangs are present. Upper molars with two exterior reëntrant folds; the front one has two similar interior folds, the others only one each. Front lower molar has two exterior and three interior reëntrant folds; the last two lower molars have generally but one reëntrant lobe on each exterior and interior side. Pelage coarse, bristly; form stout; tail generally shorter than the body. Ears large; front feet small; hind feet very long; soles naked.



FIG 31. SIGMODON HISPIDUS.

No. 360 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 4 times.

UPPER TOOTH ROW.
Enlarged 4 times.

200. hispidus. (*Sigmodon*), Say & Ord, Journ. Acad. Phil., 1825, p. 352.

ferrugineus, Harlan, Am. Journ. Scien., 1828, p. 285.

hortensis, Harlan, Med. & Phys. Res., 1835, p. 49, pl., fig. 5-8.

Type locality. River St. John, east Florida.

Geogr. Distr. Eastern United States, Carolinas to Florida.

Genl. Char. Body stout; ears large; hind feet large and strong; tail nearly as long as head and body; hair coarse.

Color. Above pale yellow ochre, mixed with black; lower parts cinereous.

Measurements. Total length, 252; tail vertebræ, 102; hind foot, 32.

a.—littoralis. (*Sigmodon*), Chapman, Bull. Am. Mus. Nat. Hist., 1889, p. 118.

Type locality. Micco, Brevard County, Florida.

Geogr. Distr. Florida Peninsula, eastern side.

Genl. Char. Similar to *S. hispidus*, but darker.

Color. General color mixed black and gray, or pale brownish gray heavily lined with yellowish brown; under parts dusky brownish gray. Tail bicolor.

Measurements. Total length, 274; tail vertebræ, 105; hind foot, 31; ear, 12.

b.—texensis. (*texianus*!. *Arvicola*), Aud. & Bach. N. Amer. Quad., 111, 1853, p. 229, pl. 147, fig. 2.

berlandieri, Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 333.

Type locality. Brazos River, Texas.

Geogr. Distr. Texas and Oklahoma Territory.

Genl. Char. Smaller than *S. hispidus*; tail shorter than head and body; hind feet rather stout.

Color. Upper parts and sides yellowish brown, inclining to reddish on the rump, and lined with black, darkest on top of head and on the back; under parts whitish or buffy white, the plumbeous under fur showing through; feet dusky; tail blackish above, dark gray below.

Measurements. Total length, 273; tail vertebræ, 120; hind foot, 32.

Specimens vary greatly in color, some being much darker than others.

c.—virizonæ. Mearns, Bull. Amer. Mus. Nat. Hist., 1890, p. 287.

Type locality. Fort Verde, Arizona.

Geogr. Distr. Arizona.

Genl. Char. Larger than *S. hispidus*; ears larger, tail longer, colors paler.

Color. Above light yellowish brown, mixed with ashy and lined with black; under parts white. Tail dusky above, whitish below.

Measurements. Average total length, 320; tail vertebræ, 121.

d.—pallidus. (*Sigmodon*), Mearns, Proc U. S. Nat. Mus. Wash., 1897, p. 504.

Type locality. Rio Grande, above El Paso, Texas.

Geogr. Distr. Eastern Desert Tract, Upper Rio Grande, Texas.

Genl. Char. Smaller than *S. hispidus texensis*; ears larger; color paler.

Color. Above buffy gray mixed with black; under parts white; feet grayish white. Tail dusky brownish above, grayish white beneath.

Measurements. Total length, 242; tail vertebræ, 103; hind foot, 30; ear, 14.

e.—cremicus. (*Sigmodon*), Mearns, Proc. U. S. Nat. Mus. Wash., 1897, p. 504.

Type locality. Cienega Well, Colorado River, Sonora.

Geogr. Distr. Western Desert Tract, Lower Colorado River.

Genl. Char. Nasals spatulate at extremity; coloring yellowish instead of grayish.

Color. Yellowish gray, the sides and rump tinged with ochraceous. Under surface white. Feet grayish white. Tail inclined to blackish above.

Measurements. Total length, 280; tail vertebræ, 128; hind foot, 34; ear, 15.

201. *spadicipygus. (*Sigmodon*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 192.

Type locality. Cape Sable, Florida.

Geogr. Distr. From Miami on the east and Tampa Bay on the west, to southern point of Florida.

Genl. Char. Smaller than *S. hispidus*; rump more rufous.

Color. Above mixed brown and black, the brown more apparent on face and sides; rump cinnamon rufous. Under parts brownish white, tinged with cinnamon; tail black above, dusky gray below; feet dusky; ears dusky.

Measurements. Total length, 263.5; tail vertebræ, 98.7; hind foot, 30.4.

*Very doubtfully separable from *S. h. littoralis*.

292. minimus. (*Sigmodon*), Mearns, Proc. U. S. Nat. Mus. Wash., 1894, p. 130.

Type locality. Upper Corner Monument, Mexican boundary line, New Mexico.

Geogr. Distr. Southern New Mexico into Mexico.

Genl. Char. Under fur darker than in *S. h. texensis*, or *S. h. arizona*; ears, feet and tail densely haired; tail not distinctly bicolor.

Color. Above grayish mixed with blackish and light yellowish brown; under parts clay buff; feet yellowish gray. Tail brownish black, paler below.

Measurements. Total length, 223; tail vertebræ, 94; hind foot, 28; ear, 12.

48. *Oryzomys*.

I. $\frac{1-1}{1-1}$; M. $\frac{3-3}{3-3} = 16$.

***Oryzomys*.** Baird, N. Am. Mamm., 1857, p. 458. Type, *Mus palustris*, Harlan.

Form rat-like. Ears nearly buried in the fur. Hairs of body coarse. Tail longer than head and body; the hairs longest on the under surface. Hind feet very long. Soles naked, with six tubercles, all very small except the posterior, which is very long and narrow. Upper margin of the orbit raised into a compressed crest, as in *Sigmodon*. (Baird, l. c.)

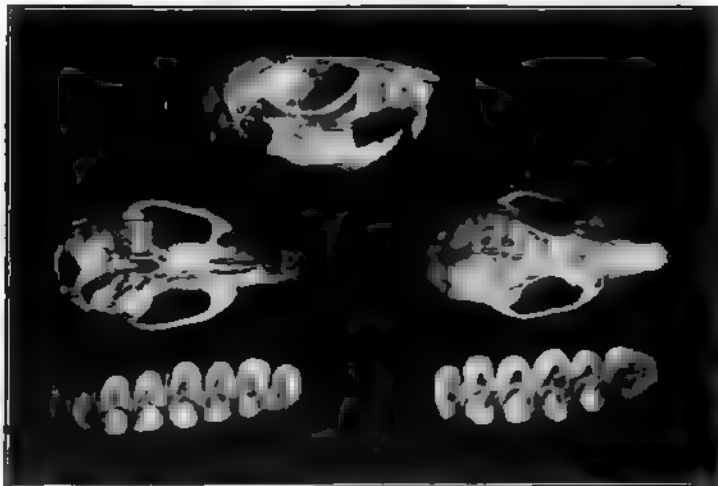


FIG. 32. *ORYZOMYS AQUATICUS*.

No. 2683 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 6 times.

UPPER TOOTH ROW.
Enlarged 6 times.

- 203. palustris.** (*Mus*), Harlan, Amer. Journ. Scien., 1837, p. 385.
oryzivora, Aud. & Bachm. N. Am. Quad., 111, 1853, p. 214, pl. 144, fig. 2.

Type locality. "Fast Land," Salem, New Jersey.

Geogr. Distr. New Jersey to Georgia.

Genl. Char. Body long; tail long; feet small; tail as long as body without head.

Color. Above brownish red heavily lined with black; sides grayish mixed with brown; beneath ashy white, or plumbeous washed with white. Feet white. Tail above dusky brown, beneath ash gray.

Measurements. Total length, 251; tail vertebræ, 124; hind foot, 30; ear, 16.

- a.—natutor.* (*Oryzomys*), Chapman, Bull. Amer. Mus. Nat. Hist., 1893, p. 44.

Type locality. Gainesville, Florida.

Geogr. Distr. Florida, west to Texas.

Genl. Char. Larger than *O. palustris*, and darker.

Color. Above rufous, heavily lined with black, darkest on median line; sides grayish brown tinged with pale brown; under parts grayish white; feet brownish white. Tail dark brown.

Measurements. Total length, 317; tail vertebræ, 153; hind foot, 35; ear, 15.

- b.—texensis.* (*Oryzomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1894, p. 177.

Type locality. Rockport, Texas.

Geogr. Distr. Eastern Texas, possibly north to Kansas?

Genl. Char. Similar to *O. palustris*, but paler.

Color. Above pale yellowish gray brown, mixed with blackish on back, forming a dorsal band; sides yellowish gray, varied with black; under parts grayish white.

Measurements. Average total length, 264; tail vertebræ, 132; hind foot, 30.

- 204. aquaticus.** (*Oryzomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1891, p. 289.

Type locality. Brownsville, Texas.

Geogr. Distr. Southeastern Texas, limits of range not determined.

Genl. Char. Large; feet small; molars large, heavy.

Color. Above yellowish brown, darker on median line; sides paler; under parts buffy. Tail above grayish.

Measurements. Average total length, 284; tail vertebræ, 144; hind foot, 31.7; ear, 10.

b.—coloratus. (*Oryzomys*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 189.

Type locality. Cape Sable, Florida.

Geogr. Distr. Southern portion of Peninsula of Florida.

Genl. Char. Size large; color reddish brown.

Color. Above reddish brown, darkest on rump and paler on sides, with a mixture of black on head and back; beneath white, often tinged with cinnamon; hairs at base plumbeous; tail dusky, whitish beneath towards base; feet whitish; ears dusky.

Measurements. Total length, 301.6; tail vertebræ, 150; hind foot, 35.

49. *Reithrodontomys*.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

J. A. Allen. *On the species of the genus Reithrodontomys.* Bull. Am. Mus. Nat. Hist. N. Y., 1895, vii., p. 107.

Reithrodontomys. Giglioli, Richer. intorn. alla Distrib. Geog. Gen., Roma, 1873, p. 160.

Reithrodon. Le Conte (nec Waterh.), Proc. Acad. Nat. Scien. Phil., 1853, p. 413.

Reithrodon. Baird (nec Waterh.), N. Am. Mamm., 1857, p. 447.

Ochetodon. Coues, Proc. Acad. Nat. Scien. Phil., 1874, p. 184.

Body slender; size very small; tail as long as body without the head; anterior face of upper incisors with a deep longitudinal groove, nearly as broad as the face of the tooth; lower incisors simple; anterior upper molar with four roots, three large, one very small. The lower half of the descending ramus is abruptly twisted inwards nearly at a right angle to the lower border of the process. Anteorbital foramen is situated in the zygomatic portion of the maxillary, and is almost circular above, contracting to a slit below. Palate terminates opposite the posterior border of last molars, as a transverse shelf; bullæ large, widely separated, but approximating anteriorly.

205. *lecontei.* (*Mus*), Aud. & Bachm. Journ. Acad. Nat. Scien. Phil., 1842, p. 307.

? *humilis*, Aud. & Bachm. Proc. Acad. Nat. Scien. Phil., 1841, p. 97.

? *carolinensis*, Aud. & Bach. Journ. Acad. Nat. Scien. Phil., 1842, p. 306.

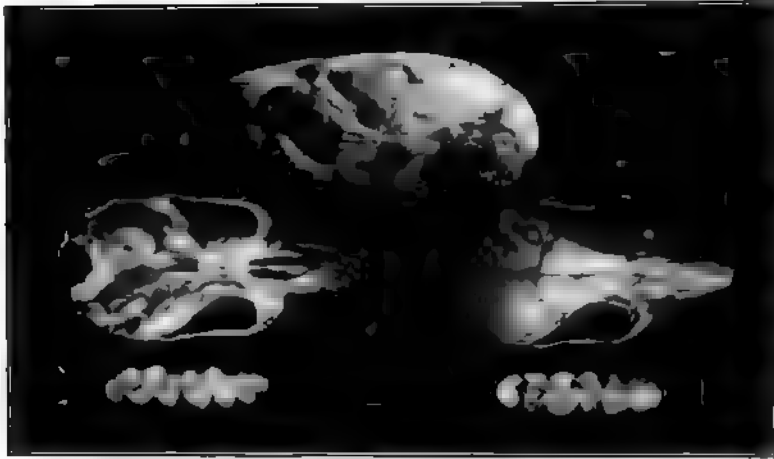


FIG. 33. REITHRODONTOMYS LECONTEI.

No. 989 Field Columbian Museum Coll. Twice nat. size.

LOWER TOOTH ROW.
Enlarged 7 times.UPPER TOOTH ROW.
Enlarged 7 times.*Type locality.* Georgia.*Geog. Distr.* Coast district of South Carolina and Georgia, southward into Florida.*Genl. Char.* Tail less than head and body.*Color.* Above fuscous brown, darker on median line; more fulvous on sides, with indistinct lateral line; under parts dingy gray, tinged with fulvous; feet whitish; ears dusky; tail dusky above, grayish white below.*Measurements.* Total length, 120; tail vertebræ, 56; hind foot, 15.5; ear, 9.5.*n.-impiger.* (*Reithrodontomys*), Bangs, Proc. Biol. Soc. Wash., 1898, p. 167.*Type locality.* White Sulphur Springs, West Virginia.*Geogr. Distr.* West Virginia.*Genl. Char.* Smaller than *R. lecontei*; tail shorter; ear smaller; molar teeth larger.*Color.* Above dark russet brown, darkest on back and rump; sides ochraceous buff; beneath grayish white tinged with fawn; feet grayish white; tail dusky above, grayish white beneath; under fur plumbeous except on chin and under side of head.*Measurements.* Total length, 112; tail vertebræ, 51; hind foot, 15; ear, 9.

h.—dickinsoni. (*Reithrodontomys*), Rhoads, Am. Nat. 1895, xxlx., p. 590.

Type locality. Willow Oak, Pasco County, Florida.

Geogr. Distr. Southern portion of Florida Peninsula.

Color. Above sooty gray, darkest along back and rump; sides tinged with brown; under parts and feet grayish; tail above same as back, beneath grayish.

Measurements. Spec. from Enterprise, Florida, in Field Columbian Museum. Total length, 125; tail vertebræ, 61; hind foot, 16.

206. merriami. (*Reithrodontomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1895, p. 119.

Type locality. Austin Bayou, Alvin, Texas.

Geogr. Distr. Coast district of southwestern Louisiana to Brazoria County, Texas.

Genl. Char. Similar to *R. lecontei*, but smaller, shorter tail and darker color.

Color. Above yellowish gray brown, darker on median line; sides yellowish gray. faint buffy lateral line. Beneath whitish gray washed with buff; tail blackish above, dusky gray beneath.

Measurements. Total average length, 112; tail vertebræ, 52; hind foot, 16.2; ear, 8.5.

207. dychei. (*Reithrodontomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1895, p. 120.

humilis, Coues, Proc. Acad. Nat. Scien. Phil., 1874, p. 185 (nec Aud. & Bachm.).

Type locality. Lawrence, Kansas.

Geogr. Distr. Kansas east to St. Louis, Missouri; south to western Oklahoma Territory; north to Nebraska and southwestern Iowa.

Genl. Char. Resembling *R. megalotis*, but darker, smaller, and with more spotted ears.

Color. Above mouse gray lined with black; fulvous on side, with indistinct lateral line; underneath whitish. Dusky spot on outer surface of ear near base, and one at base internally. Tuft of yellowish brown hairs in front of anterior base of ears. Tail dusky above, grayish white beneath. Feet white.

a.—nebracensis. (*Reithrodontomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1895, p. 122.

Type locality. Canon City, Colorado.

Geogr. Distr. Fremont County, Colorado, north to Custer, Montana, east to central and northeastern Nebraska.

Genl. Char. Larger than *R. dychei*, ears larger; color more fulvous.

Color. Above yellowish brown lined with black; sides and rump more fulvous. Beneath white.

Measurements. Average total length, 141; tail vertebræ, 64; hind foot, 16.3.

208. montanus. (*Reithrodon*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 336.

Type locality. Rocky Mountains, San Luis Valley, Colorado?

Geogr. Distr. Only known from type locality.

Genl. Char. Tail less than head and body, ears small.

Color. Above brown and pale yellowish gray; outside of ears and flanks pale yellowish brown; beneath whitish.

Measurements. Total length, 101.8; tail to end of hairs, 50.8; hind foot, 12.7; ear, 7.4.

209. megalotis. (*Reithrodon*), Baird, N. Am. Mamm., 1857, p. 451.

humilis, Coues (under *megalotis*), Proc. Acad. Nat. Scien. Phil., 1874, p. 185.

aztecus, Allen, Bull. Am. Mus. Nat. Hist., 1893, v, p. 79.

deserti, Allen, Bull. Amer. Mus. Nat. Hist., 1895, p. 127.

Type locality. Janos and San Luis Spring, Sonora, near New Mexico boundary.

Geogr. Distr. Sonora, through western New Mexico and eastern Arizona to Utah, California and southern Nevada.

Genl. Char. Largest of species.

Color. "Above mouse gray lined with darker and tinged with rufous; on rump and sides a fulvous wash. Beneath soiled yellowish white." (Baird, l. c.)

Measurements. Average total length, 143; tail vertebræ, 66; hind foot, 18.5; ear, 12.5.

210. longicaudus. (*Reithrodon*), Baird, Mamm. N. Amer., 1857, p. 451.

Type locality. Petaluma, California.

Geogr. Distr. California, west of the Sierra Nevada, from coast region of Monterey County, north to Mendocino County, and in the interior from San Joaquin County north to Tehama County. Probably further south irregularly in the coast and San Bernardino ranges of mountains (Allen).

Genl. Char. Small, colors darkish; tail long, more than half the length of head and body.

Color. Above yellowish brown and black, darkest on dorsal line; sides more yellowish and with a fulvous lateral line from cheeks to

rump; beneath grayish white tinged often with yellow, and frequently with a fulvous spot on the breast. Ears dusky, rusty brown tuft at the anterior base. Feet whitish. Tail dusky above, grayish white below.

Measurements. Average total length, 136.5; tail vertebræ, 72; hind foot, 17; ear, 11.2.

ii.—pallidus. (*Reithrodontomys*), Rhoads, Amer. Nat. 1893, p. 835.

Type locality. Santa Isabel, California.

Geogr. Distr. Southern California and northern Lower California, from Monterey County and Merced County southward.

Genl. Char. Larger than *R. longicaudus* and paler.

Color. Above buffy gray, darker on dorsal line; face and lateral line ochraceous. Under parts and feet white, spot between fore legs and on breast buff. Tail bicolor.

Measurements. Total length, 137; tail vertebræ, 73; hind foot, 16.

211. chrysotis. (*Reithrodontomys*), Elliot, Pub. Field Columb. Mus., 1899, p. 281, Zoölogy.

Type locality. Dougherty, Indian Territory.

Geogr. Distr. Only known from type locality.

Genl. Char. Similar to *R. longicaudus*, but larger; tail longer, feet larger, and ears conspicuously colored inside with orange.

Color. Above blackish brown mixed with yellow; sides of head and body and upper part of fore legs yellowish brown, almost golden on flanks. Under parts white. Feet grayish white. Tail brownish black above, white beneath. Inside of ears orange.

Measurements. Total length, 153; tail vertebræ, 79; hind foot, 20; ear, 15. Skull: occipito-nasal length, 21.5; orbital constriction, 3; length of nasals, 9; width at base, 3; mastoid breadth, 10; zygomatic breadth, 12; length of pterygoid, 4; palate, 4; of Hensel, 16; greatest breadth of molars outside anteriorly, 4.5.

212. klamathensis. (*Reithrodontomys*), Merr., N. Am. Faun., No. 16, 1899, p. 93.

Type locality. Big Spring, Shasta Valley, California.

Geogr. Distr. Shasta Valley, California, and Klamath County, Oregon.

Genl. Char. Size medium; ears and hind feet large; tail long; paler in color than *R. longicaudus*. Skull: rostrum broad; audital bullæ small.

Color. Above pale grayish brown, washed with buffy on sides; beneath white. Tail above dusky, below whitish.

Measurements. Total length, 149; tail vertebræ, 71; hind foot, 19.

213. arizonensis. (*Reithrodontomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1894, p. 320.

Type locality. Chiricahua Mountains.

Geogr. Distr. Southeastern Arizona.

Genl. Char. Similar to *R. longicaudus*, but redder and larger.

Color. Above brown lined with black and washed with reddish fulvous, median dorsal tract darker; sides golden, forming a lateral line from cheeks to tail; under parts and feet grayish white. Ears blackish. Tail dusky above, gray below.

Measurements. Total length, 152; tail vertebræ, 78; hind foot, 18; ear, 13.

a.-(mexicanus) intermedius. (*Reithrodontomys*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 136.

Type locality. Brownsville, Texas.

Geogr. Distr. Southern Texas, from Corpus Christi, southward; Rio Grande Valley to mouth of Pecos, and east to Kerr, Bexar and Bee counties, Texas. South into Mexico.

Genl. Char. Smaller than *R. mexicanus*, and paler.

Color. Above grayish brown, washed with pale yellowish, mixed with dark hairs on middle of back, sides lighter; lateral line yellowish. Beneath white. Ears brown, apical third of inner surface rufous. Feet whitish. Tail dusky, nearly unicolor.

Measurements. Total length, 194; tail vertebræ, 108; hind foot, 21; ear, 13.

b.-aurantius. (*Reithrodontomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1895, p. 137.

mexicanus, Coues, Rod., 1877, p. 128.

Type locality. Lafayette, Louisiana.

Geogr. Distr. Coast region of Texas from Matagorda County northward and eastward to Houma, La., and north to Beebe, Arkansas.

Genl. Char. Similar to *R. mexicanus*, but more golden in hue.

Color. Above yellowish brown, median area black; sides orange rufous; beneath white washed with yellowish, and an indistinct fulvous spot on the breast.

Measurements. Total length, 174; tail vertebræ, 95; hind foot, 20; ear, 12.

214. laceyi. (*Reithrodontomys*), Allen, Bull. Am. Mus. Nat. Hist., 1896, p. 235.

Type locality. Watson's Ranch, near San Antonio, Texas.

Geogr. Distr. Southeastern Texas.

Genl. Char. Similar to *R. m. intermedius*, but more fulvous, colors stronger.

Color. Above yellowish brown, mixed with blackish; indistinct fulvous lateral line. Beneath grayish white; feet soiled white. Tail long, bicolor, upper third brown, rest grayish white.

Measurements. Total length, 156; tail vertebræ, 89; hind foot, 19; ear, 12.

Sub. Fam. III. Neotominae.

50. Neotoma.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

C. H. Merriam. *The Neotominae, with descriptions of a new genus and species and a Synopsis of the known forms.* Proc. Acad. Nat. Scien. Phil., 1894, pp. 225-252.

Neotoma. Say & Ord, Journ. Acad. Nat. Scien. Phil., 1825, p. 346. Type, *M. floridana*, Ord.

Teonoma, Gray, List Spec. Mamm. Brit. Mus., 1843, p. 117.

Skull long; zygomatic width equals half the length of skull; edge of maxilla bounding anteorbital foramen, rounded; the foramen broad and open above, compressed into a somewhat narrow slit below; intermaxillaries reaching back to interorbital region; nasals much shorter; palate terminating with a concave border posteriorly between last two molars; audital bullæ small; their axis oblique to that of the skull; occipital plane of skull perpendicular, at right angles to the superior surface; process of jugal extends downward and backward, that of squamosal joining it at almost a right angle. Mandible with long, acute, coronoid process, higher than condyle. Roots of lower incisor causing protuberances on either side of the jaw; upper molar teeth with usually two external and one internal reëntrant loops; first and second lower molars with two external and two internal loops, last molar with only one of each. Upper molars three rooted; lower with but two roots. The two sections of the genus are distinguished by those with round somewhat bare tails, and those with densely haired, bushy tails; the latter having the rostrum longer, and the interorbital constriction greater.

A. Neotoma.

Tail long, bare, round.

215. *cumulator.* (*Neotoma*), Mearns, Proc. U. S. Nat. Mus. Wash., 1898, p. 503.

Type locality. Fort Yuma, San Diego County, California.

Geogr. Distr. Southern California. Range not determined.

Genl. Char. Size large; color similar to *N. intermedia*, but paler.

Color. Above grayish fulvous lined with black; gray on limbs and ochraceous buff on sides. Feet and under parts white. Tail black above, white beneath. Ears mixed gray and black.

Measurements. Total length, 406; tail vertebræ, 188; hind foot, 37; ear, 30.5.



FIG. 34. NEOTOMA FLORIDANA.

No. 595 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW
Enlarged 3 times.

UPPER TOOTH ROW
Enlarged 3 times.

216. micropus. (*Neotomus*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 333.

canescens, Allen, Bull. Am. Mus. Nat. Hist., 1891, p. 285.

Type locality. Charco Escondido, Tamaulipas, Mexico.

Geogr. Distr. San Fernando, Tamaulipas, Mexico, northward to the Pan Handle of Oklahoma, westward to the Staked Plains, Rio Grande Valley west to El Paso; Pecos Valley to Eddy, New Mexico.

Genl. Char. Tail short, hardly two-thirds the length of the body; ears large; feet small; soles naked.

Color. Above grayish lead color, lined with dark brown; sides paler; shoulders and flanks occasionally tinged with yellowish brown. Under parts and feet white. Tail above dusky, beneath grayish white.

Measurements. Total length, 359; tail vertebræ, 185; hind foot, 36; ears, 30.

a.—surberi. (*Neotoma*), Elliot, Pub. Field Columb. Mus., 1899, 1, p. 279, Zoölogy.

Type locality. Cañon three miles west of Alva, Oklahoma Territory.

Geogr. Distr. Northwestern Oklahoma.

Genl. Char. Similar to *N. micropus*, but darker, tail longer and almost black above.

Color. Upper parts, fore legs and flanks iron gray; hairs tipped with white. Beneath white; hairs of chin, throat, breast and space between hind legs white to the roots, remainder plumbeous at base. Feet white. Tail long; above grayish black on basal third; almost pure black for remainder; beneath white.

Measurements. Total length, 430; tail vertebræ, 197; hind foot, 43.

217. *campestris.* (*Neotoma*), Allen, Bull. Amer. Mus. Nat. Hist., 1894, p. 322.

Type locality. Pendennis, Lane County, Kansas.

Geogr. Distr. Kansas and Colorado.

Genl. Char. Similar in size and in skull to *N. micropus*, but colors different. Above yellowish gray varying to buffy ochraceous and lined with black; feet and under parts white. Tail pale grayish brown above, pure white below.

Measurements. Total length, 388; tail vertebræ, 155; hind foot, 40.5; ear, 25.

a.—rubula. (*Neotoma*), Bangs, Proc. Bost. Soc., 1898, p. 185.

Type locality. Gibson, Louisiana.

Geogr. Distr. Lower Mississippi Valley, east to western Florida.

Genl. Char. Larger than *N. floridana*; color more red.

Color. Above dark cinnamon russet, mixed with black on head and back; sides paler; under parts yellowish white; base of hairs plumbeous only along lower sides; feet white; ears dusky; tail reddish dusky above, grayer beneath.

Measurements. Total length, 403; tail vertebræ, 185; hind foot, 42.

b.—baileyi. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1894, p. 123.

Type locality. Valentine, Nebraska.

Geogr. Distr. Nebraska, Kansas, and Oklahoma Territory.

Genl. Char. Similar to *N. floridana*, but ears smaller, tail shorter, molars larger.

Color. Above grizzled gray; face clear gray; under parts white to roots of hair except on belly where the basal part is plumbeous. Feet white. Tail, dusky above, white below.

Measurements. Total length, 371; tail vertebrae, 165; hind foot, 39.

218. floridana. (*Mus*), Ord, Bull. Soc. Philom. Phil., 1818, p. 181.

Type locality. Florida.

Geogr. Distr. South Atlantic and Gulf Coasts, and lower Mississippi Valley.

Genl. Char. Tail short; about three-fourths the length of head and body; ears and feet large; tubercles on soles large.

Color. Above plumbeous, darkest on dorsal region, mixed with dark brown and pale yellowish brown, the latter predominating on flanks. Feet and under parts white. Tail, above dusky, below white.

Measurements. Total length, 388; tail vertebrae, 173; hind foot, 40; ear, 27.

c.—uttwateri. (*Neotoma*), Mearns, Proc. U. S. Nat. Mus. Wash., 1897, p. 721.

Type locality. Lacey's Ranch, Turtle Creek, Kerr County, Texas.

Geogr. Distr. Southern Texas; limits not determined.

Genl. Char. Similar to *N. floridana*, but tail more hairy; colors paler.

Color. Above ochraceous buff mixed with grayish and lined with black; sides clear ochraceous buff. Outer surface of limbs light gray. Feet and under parts white. Tail, above mouse gray, beneath white.

Measurements. Total length, 387; tail vertebrae, 178; hind foot, 39.4.

219. pennsylvanica. (*Neotoma*), Stone, Proc. Acad. Nat. Scien. Phil., 1893, p. 16.

Type locality. Lewis Cave, South Mountain, Cumberland County, Pennsylvania.

Geogr. Distr. New York to Virginia in Alleghany Mountains.

Genl. Char. Similar to *N. floridana*; tail less than head and body; ears moderately large.

Color. Above grayish buff lined with black, darkest on dorsal region; sides pale ochraceous lined with black; outer side of limbs pale buff grading into blue gray on lower parts; sides of lower throat deep buff; feet and under parts white; hairs of chin and upper parts of throat and middle of belly white to the roots. Whiskers black. Tail, above black mixed with brown, beneath grayish white. Ear blackish, apical half naked.

Measurements. Total length, 397; tail vertebrae, 175; hind foot, 45.

220. mexicana. (*Neotoma*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 333.

Type locality. Mountains near Chihuahua, Mexico.

Geogr. Distr. Mountain slopes in eastern New Mexico, southwestern Texas, and Chihuahua, Mexico.

Genl. Char. Ears large; feet small; tail three times the length of head and body; soles naked. Nasal bones end on the same line posteriorly, and do not extend backward to the anterior extremity of orbits; highest point of condyle higher than coronoid process.

Color. Above pale yellowish brown, lined with dark brown; sides yellowish brown. Outside of legs, feet and under parts, white. Tail, dusky above, whitish beneath.

Measurements. Total length, 340; tail vertebræ, 151; hind foot, 37; ear, 32.

21.—bullata. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1894, p. 122.

Type locality. Santa Catalina Mountains, southeastern Arizona.

Geogr. Distr. Only known from type locality.

Genl. Char. Similar to *N. mexicana*, audital bullæ small and curved toward median line anteriorly, the inner side decidedly concave and sloping inward.

Color. Above dull ochraceous buff; grayish on head and legs, and lined with black on dorsal region. Feet and under parts white, under fur plumbeous. Tail, grayish brown above, whitish beneath.

Measurements. Total length, 335; tail vertebræ, 151; hind foot, 34; ear, 22.

221. pinetorum. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1893, p. 111.

mexicana, Merr. (nec. Baird), N. Am. Faun., No. 3, 1890, p. 67, pl. x, fig. 5-8.

Type locality. San Francisco Mountain, Arizona.

Geogr. Distr. Pine covered plateau of Arizona.

Genl. Char. Similar to *N. fuscipes*, smaller; tail, ears and hind feet shorter.

Color. Above fulvous mixed with black; face grizzled gray; feet and under parts white. Tail, above blackish, below white.

Measurements. Total length, 355; tail vertebræ, 163; hind foot, 37; ear, 25.

222. fuscipes. (*Neotoma*), Baird, Mam. N. Amer., 1857, p. 495.

monochrura, Rhoads, Amer. Nat., 1894, p. 67.

splendens, True, Proc. U. S. Nat. Mus. Wash., 1894, p. 353.

Type locality. Petaluma, Sonoma County, California.

Geogr. Distr. Coast region of California and Oregon, from Monterey Bay to the Columbia River.

Genl. Char. Tail nearly as long as head and body; *unicolor*. Size large, hind feet short; soles naked. *Hairs on throat and belly white to the roots.*

Color. Above mixed reddish brown and black; sides reddish brown; dorsal region darkest. Limbs outside to wrists and ankles like the back; feet dusky; under parts yellowish white. Tail, dusky all around.

Measurements. Total length, 410; tail vertebræ, 198; hind foot, 41.

a.—microtis. (*Neotoma*), Thomas, Ann. Mag. Nat. Hist., xii, 1893, p. 234.

simplex. True, Proc. U. S. Nat. Mus. Wash., 1894, p. 354.

Type locality. San Diego, California.

Geogr. Distr. Coast region of California, south of Monterey Bay.

Genl. Char. Similar to *N. fuscipes*, but smaller, and feet white; *hairs on center portions of under parts white to the roots.* Tail short.

Color. Above mixed reddish brown and black, lighter on sides; dorsal area darkest; feet and entire under parts white. Tail, above brownish black, beneath pale brown.

Younger specimens have little or none of the reddish brown color, but are a pale yellowish brown, and the belly is often tinged with buff. This pelage is the most common, and may also represent that of winter.

Measurements. Total length, 404; tail vertebræ, 195; hind foot, 41; ear, 32.5.

b.—strenatori. (*Neotoma*), Merr., Proc. Biol. Soc., Wash., 1894, p. 124.

Type locality. Carbondale, Amador County, California.

Geogr. Distr. West slope of Sierra Nevada in California. Mountains of northeast California generally.

Genl. Char. Similar to *N. fuscipes*. Palate barely equaling length of interpterygoid fossa and basisphenoid; incisive foramina reaching back past plane of first molars; pterygoid fossa rounded anteriorly. *Hairs of under parts white to roots, save in a narrow line along the side where the base of the hairs is plumbeous.*

Color. Above dark grizzly brown, suffused with fulvous, sides fulvous, feet and under parts white. Ankles dusky. Tail, blackish above, whitish below.

Measurements. Total length, 382; tail vertebræ, 175; hind foot, 37.

c.—dispar. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1894, p. 124.

Type locality. Lone Pine, Owens Valley, California.

Geogr. Distr. East base of Sierra Nevada in Owens valley, California, and western edge of Mojave Desert.

Genl. Char. Tail shorter than that of *N. fuscipes*; colors pale; palate shorter and pterygoid fossa longer than in *N. fuscipes*, and post palatal notch rounded.

Color. Above ochraceous buff, lined on back with black; sides buffy ochraceous; feet and under parts white. Tail, brownish gray above, below soiled white.

Measurements. Total length, 410; tail vertebræ, 208; hind foot, 39; ear, 31.

d.—unnectens. (*Neotoma*), Elliot, Pub. Field Columb. Mus., 1898, 1, p. 201, Zoölogy.

Type locality. Portola, San Mateo County, California.

Geogr. Distr. Coast line of California, south of San Francisco Bay to Monterey County, as yet obtained only from San Mateo County.

Genl. Char. Tail less than half the length of body and head, *bicolor*. Intermediate in size between *N. fuscipes* and *N. macrotis*, hairs on *throat and belly only, white to the roots*.

Color. Above and on sides reddish brown varying in some examples to yellowish brown, lined with black, darkest on dorsal area. Under parts and fore feet white, hind feet obscured with dusky. Tail, slaty black above, light gray beneath.

Measurements. Average total length, 417; tail vertebræ, 201; hind foot, 41; ear, 36.

e.—affinis. (*Neotoma*), Elliot, Pub. Field Columb. Mus., 1898, 1, p. 202, Zoölogy.

Type locality. Alum Rock Park, Santa Clara County, California.

Geogr. Distr. Only known from Santa Clara County, California.

Genl. Char. Size same as *N. fuscipes*, color pale, tail long, hairs on *central part of body beneath white to the roots*.

Color. Above reddish brown and black; dorsal region darkest; flanks pale reddish brown, extending over fore legs to feet; thighs paler brown grading into dusky; face yellowish gray; under parts, inside of fore legs and feet white. Hairs beneath white to roots, except those along the sides, inside of thighs and outer side of fore legs below, which are plumbeous at base. Tail, brownish black above, gray beneath.

Measurements. Total length, 416; tail vertebræ, 193; hind leg, 40; ear, 33.

223. desertorum. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1894, p. 125.

Type locality. Furnace Creek, Death Valley, California.

Geogr. Distr. Mojave, Colorado and Sonoran Deserts of eastern California, Nevada, and western Utah, north to east Humboldt Valley, and Kelton, Utah.

Genl. Char. Similar to *N. intermedia*, but smaller; ears larger. Colors inclining to ochraceous buffy instead of gray.

Color. Above pinkish buff brightest on sides; head grayish lined with black; under parts white washed with salmon on neck; feet white. Tail, pale dusky above, white beneath.

Measurements. Total length, 305; tail vertebræ, 128; hind foot, 30.

a.—sola. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1894, p. 126.

Type locality. San Emigdio, Kern County, California.

Geogr. Distr. Head of San Joaquin Valley, California.

Genl. Char. Similar to *N. desertorum*, but larger.

Color. Above ochraceous buff lined with black; under parts and feet white. Tail, grayish brown above, white below.

Measurements. Total length, 330; tail vertebræ, 148; hind foot, 36.

224. fallax. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1894, p. 123.

Type locality. Gold Hill, Boulder County, Colorado.

Geogr. Distr. Eastern base of Rocky Mountains in Colorado.

Genl. Char. Similar to *N. intermedia*; nasals narrow and reaching the posterior plane of lachrymals. Lower third molar with three instead of two salient angles on outer side.

Color. Above buffy clay color, lined with black; feet and under parts white, base of hairs plumbeous. Tail, dusky above, white beneath.

Measurements. Total length, 330; tail vertebræ, 140; hind foot, 31; ear, 22.

225. intermedia. (*Neotoma*), Rhoads, Amer. Nat., 1894, p. 69.

californica, Price, Proc. Calif. Acad. Scien., 1894, p. 154, pl. xi.

Type locality. Dulzuras, San Diego County, California.

Geogr. Distr. Valleys and lower slopes of coast ranges of California, south of Monterey Bay.

Genl. Char. Size small, tail slender, short, bicolor; ears large; soles naked.

Color. Above light brownish gray lined with black; chin, center

of breast, inside of hind legs and feet white; rest of under parts soiled grayish buff. Tail, above sooty blackish, beneath white.

Measurements. Total length, 318; tail vertebræ, 160; hind foot, 35; ear, 28.

a.—gilva. (*Neotoma*), Rhoads, Am. Nat., 1894, p. 70.

venusta, True, Proc. U. S. Nat. Mus. Wash., 1894, p. 354.

Type locality. Banning, California.

Geogr. Distr. San Gorgonio Pass, and western edge of the Colorado Desert.

Genl. Char. Similar to *N. intermedia*, but paler in coloration, and smaller.

Color. Above brownish gray lined with black, with a slight tinge of reddish on sides and top of rump; sides pale yellowish brown; top of head grayish. Feet and under parts white, pinkish tinge on belly, and plumbeous at base of hairs showing through everywhere. Tail, above like back at base, remainder black, beneath white.

Measurements. Total length, 294; tail vertebræ, 135; hind foot, 26; ear, 30.5.

b.—albigula. (*Neotoma*), Hartley, Proc. Calif. Acad. Scien., 1894, p. 157, pl. xii.

Type locality. Fort Lowell, Arizona.

Geogr. Distr. Southern and western Arizona.

Genl. Char. Similar to both *N. intermedia* and *N. mexicana*, but the yellow ground color of upper parts and sides is deeper, and the general color is lighter.

Color. Above pale yellowish brown mixed with black, central line on back darker; sides pale yellow mixed with a pale brown; feet dusky white. Under parts grayish white, except throat which is pure white to base of hairs. Tail, blackish brown above, soiled white beneath. Ears, light brown on naked part.

Measurements. Total length, 342; tail vertebræ, 153; hind foot, 32.

c.—angusticeps. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1894, p. 127.

Type locality. Southwest corner Grant County, New Mexico.

Geogr. Distr. Southwestern New Mexico and adjacent parts of Mexico.

Genl. Char. Similar to *N. albigula*, ears smaller, color more fulvous.

Color. Above fulvous; ochraceous buff on head, lined with

black; feet and under parts creamy white to roots of hair, except on belly where the base of hairs is plumbeous. Tail, grayish brown above, white beneath.

Measurements. Total length, 335; tail vertebræ, 150; hind foot, 33; ear, 25.

B. Teonoma.

Tail large, bushy, squirrel-like; hind feet very large, orbital constriction great, rostrum long.



FIG. 35. NEOTOMA (TEONOMA) CINEREA.

No. 1903 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 3 times.

LOWER TOOTH ROW.
Enlarged 3 times.

226. cinerea. (*Mus*), Ord, Guth. Geog., 2d ed., 1815, 11, p. 292.

Type locality. Near Great Falls, Montana.

Geogr. Distr. Rocky Mountain region from Utah to Wyoming; east to Black Hills and North Dakota, west of Missouri River; west in southern British Columbia in Cascade Range, and south through the Sierra Nevada to Mt. Whitney in southern California (Merriam).

Genl. Char. Tail hairy, full; shorter than head and body; posterior third of soles furred.

Color. Above pale yellowish brown mixed with dusky; feet and

under parts white. Tail, above grayish lead color, beneath white. Belly hairs pure white to the roots.

Measurements. Total length, 387; tail vertebræ, 165; hind foot, 42; ear, 31.5.

a.—lepida. (*Neotoma*), Thomas, Ann. & Mag. Nat. Hist., 1893, p. 235.

Type locality. Utah.

Geogr. Distr. Range not known.

Genl. Char. Size small; skull small, delicate; frontal profile flattened; supra orbital edges square, scarcely ridged; palatine foramen as in *N. macrotis*; molars small.

Color. Above ashy gray, washed with pale fawn; under parts white, hairs on belly gray at base. Tail, thickly haired, brownish fawn above, white beneath.

Measurements. Total length, 280; tail vertebræ, 100; hind foot, 27.2; ear, 25.

b.—drummondi. (*Myoxus*), Richards, Zool. Jour., 1828, p. 517.

Type locality. Rocky Mountains, British Columbia, N. Lat. 57°.

Geogr. Distr. Limits unknown. Eastern British Columbia and western Canada.

Genl. Char. Tail bushy, longer than the body; ears large, oval; posterior half of soles furred.

Color. General color light yellowish brown mixed with black; feet and under parts white. Tail, basal portion above like back, remainder dark lead gray; beneath white.

Measurements. Total length, 393; tail vertebræ, 165; hind foot, 36; ear, 20.

c.—occidentalis. (*Neotoma*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 335.

Type locality. Shoalwater Bay, Washington.

Geogr. Distr. Pacific coast region of Oregon and Washington, eastward to plains of central Idaho.

Genl. Char. Tail longer than the body without head, ears large, scantily haired; posterior part of sole furred.

Color. Upper parts dark brown nearly black, lined with yellowish brown, sides tinged with yellowish brown, feet and under parts bluish white. Tail above basal part like back, remainder brownish plumbeous. Long black hairs are visible over the body.

Measurements. Total length, 412; tail vertebræ, 192; hind foot, 33; ear, 26.

d.-fusca. (*Neotoma*), True, Proc. U. S. Nat. Mus. Wash., 1894, p. 354.

Type locality. Fort Umpqua, Oregon.

Geogr. Distr. Oregon, limits of range not determined.

Genl. Char. Tail less than half the length of head and body; colors dark.

Color. Above blackish, sides and underneath neck tawny gray; outer surface of limbs gray, under parts soiled white; fore feet white, hind feet dusky. Tail, above black, buffy gray below.

Measurements. Total length, 395; tail vertebræ, 180; hind foot, 44.

e.-columbiana. (*Neotoma*), Elliot, Pub. Field Columb. Mus., 1893, 1, p. 255; Zoölogy (note).

Type locality. Ducks, British Columbia.

Geogr. Distr. Western British Columbia, range unknown.

Genl. Char. Colors paler than those of *N. occidentalis*, tail less than the length of head and body.

Color. Nose and space between eyes light mouse gray; top of head and back dark gray; sides of face and flanks, shoulders and thighs, pale grayish buff, nearly clear buff along the belly. Entire under parts and under sides of limbs white; chest and abdomen tinged with yellow. Feet white. Tail bushy, at base like back, remainder blackish gray, under side white. Ears blackish, naked save hairy fringe on edge.

Measurements. Total length, 408; tail to end of hair, 194; hind foot, 37.

227. arizonæ. (*Neotoma*), Merr., Proc. Biol. Soc. Wash., 1893, p. 110.

Type locality. Keam's Cañon, Apache County, Arizona.

Geogr. Distr. Moki region northeastern Arizona, northwestern New Mexico, southeastern Utah, and southwestern Colorado.

Genl. Char. Similar to *N. cinerea*, but smaller; ears large; a broad slit-like opening on each side of the presphenoid and anterior third of the basi-sphenoid, as in the round-tailed species.

Color. Above ochraceous buff, mixed with black; feet and under parts white. Tail, grayish brown above, white beneath.

Measurements. Total length, 365; hind foot, 35; ear, 34.

228. grangeri. (*Neotoma*), Allen, Bull. Amer. Mus. Nat. Hist., 1894, p. 324.

Type locality. Custer, Black Hills, South Dakota.

Geogr. Distr. South Dakota, range unknown.

Genl. Char. Similar in size and color to *N. cinerea*, but with well developed sphenopalatine vacuities.

Color. Above gray mixed with dusky, ground hue clay color to pale buffy, lined with black; head gray without tinge of fulvous; feet white; ears blackish; under parts white. Tail above dusky gray, white beneath.

Measurements. Total length, 393; tail vertebræ, 173; hind foot, 41; ear, 28. Skull: total length, 51; basal length, 49; parietal breadth, 28; least interorbital breadth, 5; nasals, 19; incisive foramina, 12; palate, 9.

229. orolestes. (*Neotoma*), Merr. Proc. Biol. Soc. Wash., 1894, p. 128.

Type locality. Sagauche Valley, Colorado.

Geogr. Distr. Rocky Mountains, Colorado, Wyoming and New Mexico.

Genl. Char. Similar to *N. cinerea*; size large; tail large; sphenopalatine vacuities open.

Color. Above buffy ochraceous, suffused with fulvous and lined with black; top of head grayish; feet and under parts white. Tail above like back at base, remainder dusky; beneath whitish, tinged with fulvous.

Measurements. Total length, 413; tail vertebræ, 175; hind foot, 41; ear, 31.

230. rupicola. (*Neotoma*), Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 323.

Type locality. Corral Draw, Black Hills, South Dakota.

Geogr. Distr. Bad Lands, South Dakota.

Genl. Char. Similar to *N. campestris*, but smaller and paler, and with larger ears and bushy tail.

Color. Above creamy buff, lined with black, darkest on dorsal region; feet and under parts pure white to the base of hairs. Tail above gray; below white. Ears grayish, edged with white.

Measurements. Total length, 330; tail vertebræ, 154; hind foot, 41; ear, 27.

231. cinnamomea. (*Neotoma*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 331.

Type locality. Kinney Ranch, Bitter Creek, Wyoming.

Geogr. Distr. Wyoming, Uncompahgre Indian Reservation, Utah; New Mexico.

Genl. Char. Similar to *N. rupicola*, but larger, colors deeper.

Color. Above buffy ochraceous, tinged with vinaceous, dorsal region lined with black; sides ochraceous buff; feet and under parts white to roots of hairs. Tail gray above, white below; ears brownish.

Measurements. Average total length, 364; tail vertebræ, 158; hind foot, 41.

Sub. Fam. IV. **Microtinae.**

G. S. Miller, *Genera and Subgenera of Voles and Lemmings*. N. Am. Faun., No. 12, 1896.

Molars imperfectly rooted or rootless (except *Phenacomys* and *Evotomys*, which have rooted molars in old adults); swelling on inner side of mandible caused by root of lower incisor, between condyle and the descending process, the latter hamular; palate arched; nasals not extending beyond premaxillaries.

51. Phenacomys.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

G. S. Miller, *Synopsis of the Voles of the Genus Phenacomys*, Proc. Biol. Soc. Wash., 1897, pp. 73-87.

Phenacomys. Merr. N. Am. Faun., No. 2, 1889, p. 28. Type, *P. intermedius*, Merr.

Skull and teeth as in *Microtus*, but the adult has the molars two-rooted, and the root of lower incisor does not reach the level of the dental foramen. Lower molars on inner side have deeper reëntrant angles than on the outer.



FIG. 36. PHENACOMYS OROPHILUS.

No. 5053 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 5 times.

UPPER TOOTH ROW.
Enlarged 5 times.

232. Intermedius. (*Phenacomys*), Merr. N. Am. Faun., No. 2, 1889, p. 32.

Type locality. Kamloops, British Columbia.

Geogr. Distr. Known only from type locality.

Genl. Char. Size small, colors pale; front lower molar with five salient angles on outer side.

Color. Above grizzled grayish brown, tinged with yellow, and sprinkled with black; dorsal region darkest; under parts grayish white. Tail almost black above, white below. Feet pale brownish.

Measurements. Total length, 118; tail vertebræ, 28; hind foot, 18; ear, 13.

233. orophilus. (*Phenacomys*), Merr. N. Am. Faun., No. 5, 1891, p. 65.

truei, Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 331.

oramontis, Rhoads, Am. Nat., 1895, p. 941.

Type locality. Salmon River Mountains, Idaho.

Geogr. Distr. Alberta, British Columbia, and western United States to southern central Oregon, central Idaho and southern Wyoming.

Genl. Char. Small; color light gray; interorbital region of skull narrow; ascending branches of premaxillæ narrow.

Color. Above grizzled grayish brown, tinged with yellow, lined with black; under parts soiled white; feet pure white. Tail mixed brown and white above, pure white beneath. Under fur plumbeous.

Measurements. Total length, 146; tail vertebræ, 38; hind foot, 19.

234. olympicus. (*Phenacomys*), Elliot, Pub. Field Columb. Mus., 1899, 1, p. 225, Zoölogy.

pumilus, Elliot, Pub. Field Columb. Mus., 1899, p. 258, Zoölogy, juv.

Type locality. Happy Lake, Olympic Mountains, Clallam County, Washington.

Geogr. Distr. Known only from type locality, and Boulder Lake, Olympic Mountains.

Genl. Char. Smaller than *P. orophilus*, with longer tail and darker pelage.

Color. Upper parts dark cinnamon, grizzled with tawny ochraceous; flanks paler. Under parts whitish, base of hairs plumbeous; legs and feet white. Tail above like back, beneath white.

Measurements. Total length, 125; tail vertebræ, 27; hind foot, 15; ear, 9.

235. preblei. (*Phenacomys*), Merr. Proc. Biol. Soc. Wash., 1896, p. 45.

Type locality. Long's Peak, Colorado.

Geogr. Distr. Known from type locality only.

Genl. Char. Similar to *P. orophilus*, but more ochraceous; ascending branches of premaxillæ more expanded terminally.

Color. Above clay color, suffused with ochraceous, sprinkled with black on dorsal region; under parts yellowish white; feet soiled white. Tail brownish above, whitish beneath.

Measurements. Total length, 130; tail vertebræ, 30; hind foot, 17.

236. celatus. (*Phenacomys*), Merr. N. Am. Faun., No. 2, p. 33.

latimanus, Merr. N. Am. Faun., No. 2, p. 34.

ungava, Merr. N. Am. Faun., No. 2, p. 35.

Type locality. Fort Chimo, Ungava, Labrador.

Geogr. Distr. Northwestern Labrador to Peninsula Harbor, northeastern shore of Lake Superior.

Genl. Char. Size moderate; face more yellow than rest of head.

Color. Above pale yellowish cinnamon brown, tinged with reddish on face, mixed with black; feet and under parts whitish gray. Tail dark brown above, whitish below.

Measurements. Total length, 134; tail vertebræ, 29; hind foot, 18.1.

237. constablei. (*Phenacomys*), Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 4.

Type locality. Telegraph Creek, Northwest Territory.

Geogr. Distr. Known only from type locality.

Genl. Char. Size equal to *P. preblei*; in dentition and coloration to *P. celatus*.

Color. Above brown tinged with chestnut and mixed with black; face and top of head yellowish chestnut; flanks paler; under parts grayish white, base of fur plumbeous; feet brownish white. Tail, blackish above, gray below; at base of ears a whitish tuft.

Measurements. Total length, 124; tail vertebræ, 32; hind foot, 19.

238. longicaudus. (*Phenacomys*), True, Proc. U. S. Nat. Mus. Wash., 1890, p. 303.

Type locality. Marshfield, Coos County, Oregon.

Geogr. Distr. Probably coast district of Oregon.

Genl. Char. Size large, tail less than length of head and body.

Color. Above bright rusty brown mixed with black; under parts white tinged with rusty brown. Hairs on throat white to roots, all the rest plumbeous at base. Tail, uniform dusky chocolate brown. Feet brown.

Measurements. Total length, 148; tail to end of hairs, 62; hind foot, 20; ears, 4.6.

52. Evotomys.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

V. BAILEY. *Revision of the American Voles of the genus Evotomys*.
Proc. Biol. Soc. Wash., 1897, p. 113.

Evotomys. Coues, Proc. Acad. Nat. Scien. Phil., 1874, p. 186.

Type. *Mus rutilus*, Pallas.

Skull weak; zygomata slender and projecting but slightly outward; audital bullæ large, inflated; interorbital region broad; mandible slender, weak; median process or shelf on palatal arch opposite middle molar. Coronoid process of mandible with the apex below the level of condyle. Molars two-rooted in old adults; front upper molar with five exterior and interior triangles; middle upper molar with four; back upper molar with seven, three exterior and four interior. Fur long, soft; ears projecting beyond the fur; feet small; a reddish or reddish brown dorsal stripe usually present. Lateral glands as in *Arvicola*, usually present in adult males.

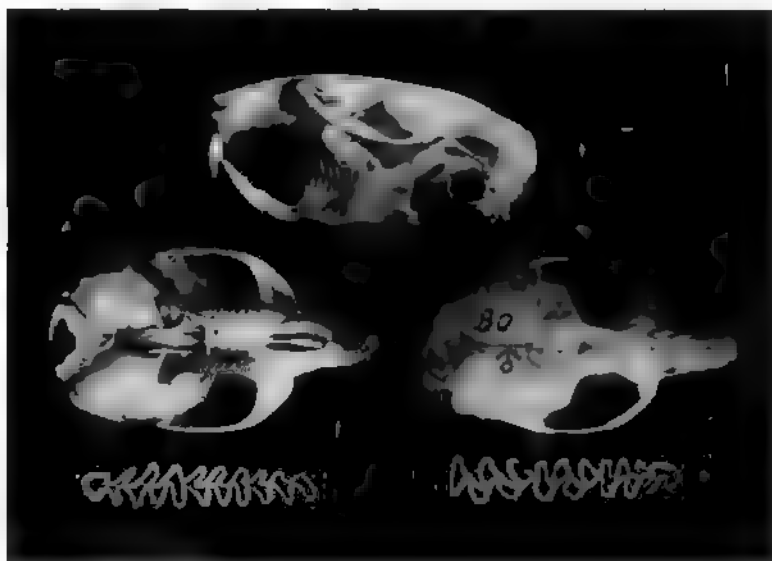


FIG. 37. EVOTOMYS GAPPERI

No. 80 Field Columbian Museum Coll. Enlarged $\frac{1}{2}$.

LOWER TOOTH ROW.
Enlarged 6 times.

UPPER TOOTH ROW.
Enlarged 6 times.

239. rutilus. (*Mus*), Pall., Glir., 1778, p. 246, pl. 14 B.

Type locality. Siberia, east of the Obi.

Geogr. Distr. Arctic regions of America, Europe and Siberia.

Genl. Char. Tail short, thick, bristly; hind feet stout; feet and ears densely haired.

Color. Winter Pelage. Dorsal stripe ferruginous, mixed with black; face, sides and rump buffy ochraceous; beneath cream color, feet white; ears rufous. Tail, above brownish at base, rest blackish; beneath buff.

Summer Pelage. Dorsal stripe darker; sides paler; beneath whitish; feet gray.

Measurements. Total length, 130; tail vertebræ, 30; hind foot, 20. Skull: basal length, 23.5; nasals, 7.8; zygomatic breadth, 14.3; mastoid breadth, 12; alveolar length of upper molars, 5.

240. wrangeli. (*Evotomys*), Bailey, Proc. Biol. Soc. Wash., 1897, p. 120, pl. 111, fig. 5.

Type locality. Wrangel, Alaska.

Geogr. Distr. Only known from Wrangel and Revillagigedo Islands, Alaska.

Genl. Char. Size large; tail about twice as long as hind foot; colors dull. Skull narrow; rostrum long, decurved; nasals usually notched, incisors large.

Color. Upper parts dark chestnut, shaded with liver brown; cheeks and sides sepia gray, the latter suffused with yellowish buff; under parts washed with buffy ochraceous; feet dusky gray; tail blackish above, soiled buff below.

Measurements. Average total length, 147; tail vertebræ, 37; hind foot, 20. Skull: basal length, 24.3; nasals, 8; zygomatic breadth, 13.5; mastoid breadth, 11; alveolar length of molar series, 5.5.

241. caurinus. (*Evotomys*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 21.

Type locality. Lund, east shore of Malaspina Inlet, British Columbia.

Geogr. Distr. Coast region of British Columbia east of the Strait of Georgia and south of the Frazer River.

Genl. Char. Similar to *E. wrangeli*. Size small, color dark, tail short. Skull: short and wide, with narrow rostrum, and small auditory bullæ.

Color. Summer Pelage. Above dark chestnut lined with black; sides sepia gray tinged with buff; face dark gray, ears buffy; under parts whitish; glandular spots whitish. Tail, chestnut above, buffy beneath, tip blackish.

Measurements. Total length, 135; tail vertebræ, 34; hind foot, 18.

242. dawsoni. (*Evotomys*), Merr., Am. Natur., 1888, xxii, p. 649.

Type locality. Finlayson River, Northwest Territory, lat. $61^{\circ} 30'$ N., long. $120^{\circ} 30'$ W. Altitude 3,000 feet.

Geogr. Distr. Finlayson River and Fort Liard, west to Yakutak and Juneau, and north along coast to Prince William Sound.

Genl. Char. Size large; tail short rarely twice as long as hind foot. Skull: short, broad; audital bullæ very small and flat; nasals rounded; notch in center of palatal arch; incisors large.

Color. Above bright ferruginous; face, sides and rump buffy ochraceous; belly washed with pale buff; feet buffy; an indistinct yellowish post-auricular spot; faint yellowish orbital ring; tufts of rufous hairs in front of ears; usually white patch on throat. Tail, above mixed rufous and black, beneath buffy ochraceous.

Measurements. Average total length, 144; tail vertebræ, 33; hind foot, 20. Skull: basal length, 22.5; nasals, 7.5; zygomatic breadth, 14; mastoid, 12.2.

243. orca. (*Evotomys*), Merr., Proc. Wash. Acad. Scien., 1900, p. 24.

Type locality. Orca, Prince William Sound, Alaska.

Genl. Char. Size medium, skull similar to *M. dawsoni*.

Color. Above dark chestnut, darkest on rump; sides yellowish mixed with black; face grizzled with buffy gray and black; beneath deep ochraceous; hind feet dusky. Tail, dusky above, buffy beneath.

Measurements. Total length, 138; tail vertebræ, 30; hind foot, 20.

244. gapperi. (*Arvicola*), Vigors, Zool. Journ., v, 1830, p. 204, pl. ix.

fuscodorsalis, Allen, Bull. Amer. Mus. Nat. Hist., 1894, p. 103.

Type locality. Lake Simcoe, Ontario, Canada.

Geogr. Distr. Massachusetts, New Jersey and Pennsylvania northward, and in Canada west to the Rocky Mountains.

Genl. Char. Slender, color bright; feet delicate, tail about twice the length of hind foot.

Color. Winter Pelage. Dorsal stripe chestnut mixed with black; sides buffy ochraceous; under parts pale buff; feet silvery gray. Tail, above brownish, pencil black, beneath grayish buff to the tips.

Summer Pelage. Colors generally darker everywhere.

Measurements. Total length, 143; tail vertebræ, 38; hind foot, 18.

a.—ochraceus. (*Evotomys*), Miller, Proc. Bost. Soc., 1894, p. 193.

Type locality. Mount Washington, New Hampshire.

Geogr. Distr. White Mountains of New Hampshire, and probably east to Nova Scotia.

Genl. Char. Similar to *E. gapperi*, but slightly larger, duller and paler. Skull like that of *E. gapperi*.

Color. Dorsal area, pale rusty rufous; sides buffy clay color; beneath plumbeous, washed with whitish; feet gray. Tail, brownish above, buffy below.

Measurements. Total length, 148; tail vertebræ, 39.6; hind foot, 19.

b.—rhoadsi. (*Evotomys*), Stone, Amer. Nat., 1893, p. 54.

Type locality. Mays Landing, New Jersey.

Geogr. Distr. Type locality only.

Genl. Char. Similar to *E. gapperi*, dorsal stripe slightly darker; tail shorter; hind foot larger.

Color. Above chestnut; sides buffy gray; beneath washed with whitish, rest as in *E. gapperi*.

Measurements. Total length, 139.3; tail vertebræ, 36; hind foot, 20.

c.—loringi. (*Evotomys*), Bailey, Proc. Biol. Soc. Wash., 1897, p. 125.

Type locality. Portland, North Dakota.

Geogr. Distr. Timbered valleys on edge of plains in Minnesota, and eastern North and South Dakota.

Genl. Char. Size very small; colors bright; skull slender.

Color. Winter Pelage. Above reddish hazel, hoary; face, sides and rump grayish ash washed with buffy; beneath pure white; feet white. Tail, blackish above, whitish below. White and grayish spots over side glands.

Summer Pelage. Above dark chestnut; face and sides pale bister, suffused with yellowish; beneath washed with whitish, feet dusky; tail darker than in winter; side spots in male sooty gray.

Measurements. Average total length, 123; tail vertebræ, 31.5; hind foot, 17.9. Skull: basal length, 21.5; nasals, 6.8; zygomatic breadth, 12.8; mastoid breadth, 10.9; length of upper molar series, 5.

d.—galei. (*Evotomys*), Merr., N. Amer. Faun., No. 4, p. 23, pl. 11, fig. 3.

Type locality. Ward, Boulder County, Colorado.

Geogr. Distr. Mountains of Colorado, north on eastern ranges of Rocky Mountains to northern Montana.

Genl. Char. Similar to *E. gapperi*, but larger; longer tail; colors lighter; skull with prominent superciliary ridges in old individuals.

Color. Winter Pelage. Above reddish chestnut: sides and face buffy gray; feet and belly whitish or yellowish gray. Tail, blackish above, whitish beneath.

Summer Pelage. Dorsal stripe darker; sides and face clear gray; feet gray.

Measurements. Average total length, 145; tail vertebræ, 43.6; hind foot, 18.2.

e.—saturatus. (*Evotomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 284.

Type locality. Nelson, British Columbia.

Geogr. Distr. Blue Mountains of Oregon, mountains of northern Idaho, and northward into British Columbia to Cariboo Lake.

Genl. Char. Larger than *E. gapperi*, tail longer; ears larger; hind feet stouter; side spots over glands conspicuous. Skull larger, wider and more angular than *E. gapperi*; premaxillæ projecting slightly back of truncate posterior end of nasals; palatine bone U-shaped, with straight posterior margin.

Color. Above light reddish chestnut; face, sides and lower rump dark gray, belly washed with white. Throat patch white. Tail light gray above, dark gray beneath.

Measurements. Average total length, 149; tail vertebræ, 45; hind foot, 18.2. Skull: basal length, 22.3; nasals, 6.5; zygomatic breadth, 13.5; mastoid, 11.2.

245. brevicaudus. (*Evotomys*), Merr., N. Am. Faun., No. 5, 1891, p. 119, pl. 111, figs. 7, 8.

Type locality. Custer, Black Hills, South Dakota.

Geogr. Distr. Black Hills, South Dakota.

Genl. Char. Large as *E. gapperi*; rather larger hind foot; tail shorter. Color in summer paler.

Color. Summer Pelage. Similar to *E. loringi*, but paler, mixed with black above; sides ash gray suffused with buff; belly cream white; side spots gray.

Measurements. Total length, 125; tail vertebræ, 31; hind foot 19. Skull: basal length, 21.2; nasals, 6.6; zygomatic breadth, 12.5; mastoid, 11.3; upper molar series, 5.4.

246. carolinensis. (*Evotomys*), Merr., Amer. Jour. Scien., xxxxi, 1888, p. 460.

Type locality. Roan Mountain, North Carolina, 6,000 feet altitude.

Geogr. Distr. High mountains of North Carolina, West Virginia and Tennessee.

Genl. Char. Size large, tail long, color dark.

Color. Summer Pelage. Above dark chestnut; face, sides and rump bister mixed with black; belly white and buffy ochraceous; feet grayish brown; ears dusky; tail blackish above, gray below.

Winter Pelage. Paler and brighter; sides buffy ochraceous; ears tipped with rufous.

Measurements. Average total length, 149; tail vertebræ, 44; hind foot, 20.2. Skull: basal length, 23.5; nasals, 7.5; zygomatic breadth, 14.4; mastoid, 12; upper molar series, 6.

247. ungava. (*Evotomys*), Bailey, Proc. Biol. Soc. Wash., 1897, p. 130.

Type locality. Fort Chimo, Ungava.

Geogr. Distr. Labrador.

Genl. Char. Size as *E. gapperi*; tail and feet slender; ears small; color dull; skull slender, rostrum not decurved.

Color. Above dull brownish chestnut; sides and face buffy gray lined with black; beneath dark plumbeous washed with buffy; feet dusky gray; tail brownish above, buffy below; sides of nose and spot on under lip whitish.

Measurements. Total length, 134; tail vertebræ, 39; hind foot, 19. Skull: basal length, 22.8; nasals, 7; zygomatic breadth, 13.5; mastoid, 11; length upper molar series, 5.

248. idahoensis. (*Evotomys*), Merr., N. Am. Faun., No. 5, p. 66.

Type locality. Sawtooth or Alturus Lake, east foot of Sawtooth Mountain, Idaho.

Geogr. Distr. Mountains of south central Idaho, between the Snake and Salmon Rivers.

Genl. Char. Larger than *E. gapperi*; tail longer; skull narrow.

Color. Above pale hazel lined with black; face, sides and rump ash gray; beneath whitish; ears sooty gray; feet gray; tail blackish above, gray below.

Measurements. Total length, 153; tail vertebræ, 48; hind foot, 20. Skull: basal length, 23.5; nasals, 8; zygomatic breadth, 13.3; mastoid, 11.6; length of upper molar series, 5.4.

249. mazama. (*Evotomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 71.

Type locality. Crater Lake, Mt. Mazama, Oregon. Altitude, 7,000 feet.

Geogr. Distr. Crest of the Cascade Mountains in Oregon.

Genl. Char. Large; tail long; colors bright; gland spots conspicuous. Skull broad and angular; rostrum straight; audital bullæ large; pterygoids prominent and inflated at tips, rounded anteriorly with a median posterior projection.

Color. Above cinnamon rufous or hazel, shading into the buffy gray of face and sides; beneath buffy white; side spots over glands frosted slaty gray; feet grayish white; tail blackish above, whitish below.

Measurements. Average total length, 157; tail vertebræ, 52; hind

foot, 18.7. Skull: basal length, 23.3; nasals, 7.2; zygomatic breadth, 14.2; mastoid, 12.4; length of upper molar series, 5.

250. obscurus. (*Evotomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 72.

Type locality. Prospect, Upper Rogue River Valley, Oregon.

Geogr. Distr. West slope of southern Cascade Range and northern Sierra Nevada in southern Oregon and northern California.

Genl. Char. Similar to *E. mazama*, color grayish, glands inconspicuous.

Color. Above olive gray; dorsal area cinnamon rufous mixed with black, illy defined; face and sides gray; beneath dull buff; ears dusky; feet dusky gray; tail bicolor.

Measurements. Total length, 155; tail vertebræ, 47; hind foot, 17. Skull: basal length, 21.8; zygomatic breadth, 13.3; mastoid, 11.5; length of molar series, 4.5.

251. californicus. (*Evotomys*), Merr., N. Am. Faun., No. 4, p. 26, pl. 11, fig. 2.

Type locality. Eureka, Humboldt County, California.

Geogr. Distr. Coast of Oregon and northern California.

Genl. Char. Size large; tail long; colors dark; ears small; lateral glands well defined. Skull with short, stout decurved rostrum; pterygoids and bullæ larger than in any other species; palatines triangular in outline and with a posterior projection; zygomata bent down, not abruptly spreading; molars wide and heavy; posterior upper molar short; terminal loop very small or absent.

Color. Above sepia; dark chestnut on back, and dusky on rump; glandular spots plumbeous, beneath pale buffy; feet whitish; ears dusky; tail blackish above, whitish beneath.

Measurements. Total length, 161; tail vertebræ, 50; hind foot, 21. Skull: basal length, 22.8; nasals, 7.5; zygomatic breadth, 14; mastoid, 12.3; length of upper molar series, 5.3.

252. occidentalis. (*Evotomys*), Merr., N. Am. Faun., No. 4, p. 25, pl. 11, fig. 1.

pygmæus, Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 284.

Type locality. Aberdeen, Washington.

Geogr. Distr. Puget Sound and coast region of Washington, and southern British Columbia.

Genl. Char. Smaller than *E. californicus*; tail long, slender; skull thin, light; audital bullæ much inflated, approaching each other over basioccipital; pterygoids flat, perforated at base; palatines with a posterior projection.

Color. Above dull burnt umber or dark chestnut lined with

black; sides dusky gray suffused with buffy; glandular patch dark sooty gray; tail blackish; feet dusky; under parts salmon buff.

Measurements. Total length, 145; tail vertebræ, 45; hind foot, 18.

253. nivarius. (*Evotomys*), Bailey, Proc. Biol. Soc. Wash., 1897, p. 137.

Type locality. Olympic Mountains, Washington. Altitude, 4,000 feet on N. W. slope of Mt. Ellinor.

Geogr. Distr. High altitude Olympic Mountains.

Genl. Char. Similar to *E. occidentalis*, but color lighter. Skull angular; posterior edge of palatine straight.

Color. Above light chestnut; sides dark gray tinged with buff; under parts whitish; postauricular spot whitish; ears dusky; tail dusky above, whitish below; feet soiled white.

Measurements. Total length, 150; tail vertebræ, 50; hind foot, 18. Skull: basal length, 21; nasals, 6.5; zygomatic breadth, 13; mastoid, 11.5; length of upper molar series, 5.

254. proteus. (*Evotomys*), Bailey, Proc. Biol. Soc. Wash., 1897, p. 137.

Type locality. Hamilton Inlet, Labrador.

Geogr. Distr. Labrador, range undetermined.

Genl. Char. Size large; colors variable. Skull large, angular, interorbital constriction deep; process of squamosal strongly marked.

Color. Above usually sepia, with cheeks, face and sides smoke gray tinged with yellowish; under parts light smoke gray; feet dull gray; tail dusky above, dull gray below.

Other specimens have the dorsal band bright chestnut, and sides dark yellowish brown.

Measurements. Total length, 171; tail vertebræ, 53; hind foot, 21; ear, 17.

255. alascensis. (*Evotomys*), Miller, Proc. Acad. Nat. Scien. Phil., 1898, p. 364, fig. 2.

rutilus, Coues, Mon. Rodents, 1877, p. 136 (nec Pallas).

Type locality. St. Michaels, Alaska.

Geogr. Distr. Alaska, Fort Yukon to St. Michaels. Limits of range unknown.

Genl. Char. Nasal bones long, one-third greatest length of skull; tail, 20–30. Color dull ferruginous.

Color. "Above dull ferruginous mixed with black; sides ochraceous buff lined with black; belly buff grading to grayish on throat;

feet buffy whitish; face mixed buffy and reddish. Tail buffy below, brownish tinged with red above; ears dull ferruginous."

Measurements. Total length, 110; tail vertebræ, 23; hind foot, 18; ear, 12.6. Skull: greatest length, 25; nasals, 8; zygomatic breadth, 13.4; mastoid, 11.6.

53. *Microtus*.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Vernon Bailey. *Revision of the American Voles of the genus Microtus*. North Am. Faun., 1900, No. 17.

Microtus. Schrank, Faun. Boica, I, 1798, p. 66. Type, *Mus arvalis*, Pall.

Arvicola. Lacep., Mem. l'Institut., 1801, III, p. 489.

Mynomes. Rafin., Am. Month. Mag., 1817, II, p. 45.

Psammomys. LeConte, Ann. N. Y. Lyc. Nat. Hist., 1830, p. 132 (nec Cretzschmer).

Pitymys. McMurtr., Am. ed. Cuv. Anim. King., 1831, I, p. 434.

Ammomys. Bon., Sagg. Dist. Met. degli. Anim. Vert., 1831, p. 20 (footnote).

Pinemys. Less., Hist. Nat. Mamm. et Ois decouv. depuis, 1788, Ouvre de Buff., 1836, v, p. 436.

Hemiotomys. De Selys Longchamps Essai, Mon. Campagn., Liège, 1836, p. 7.

Lagurus. Glog., Gemeinn. Hand-u-Hilfsb. Naturgesch., 1841, p. 97.

Neodon. Hodg., Ann. Mag. Nat. Hist., 1849, p. 333.

Agricola. Blas., Faun. Wirbelt Deutsch., 1857, p. 334.

Chilotus. Baird, N. Am. Mamm., 1857, p. 516.

Paludicola. Blas., Faun. Wirbelt Deutsch., 1857, p. 333.

Pedomys. Baird, N. Am. Mamm., 1857, p. 517.

Praticola. Fatio, Les Campagn. Bass. Lémm, 1867, p. 36 (Part).

Terricola. Fatio, Les Campagn. Bass. Lémm, 1867, p. 36 (Part).

Sylvicola. Fatio, Les Campagn. Bass Léman, 1867, p. 63.

Ochotomys. Fitzin., Sitzungb. K. Akad. Wiss. Wien, 1867, p. 47.

Micrurus. Forsyth-Major, Alt. dell. Soc. Tosc. Scien. Nat., 1876, III, p. 126.

Eremiomys. Palyakoff, Mem. Acad. Imp. Sc. St. Petersb., 1881, p. 34.

Campicola. Schulze, Schrift-Natur. Ver. Harz. Wernig., 1890, p. 24.

Tetramerodon. Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 282.

Aulacomys. Rhoads, Am. Nat., 1894, p. 182.

Orthriomys. Merr., Proc. Biol. Soc. Wash., 1898, p. 107.

Herpetomys. Merr., Proc. Biol. Soc. Wash., 1898, p. 107.

Molars not rooted, mandibular molars without closed triangles on outer side; upper incisors not grooved; root of lower incisor extending back to third molar, displacing base of that tooth, and terminating above the dental foramen of the ascending ramus. Tail terete, longer than hind foot; posterior border of bony palate very variable; middle part of zygoma only slightly expanded; postorbital process of squamosal shelf-like.

A. *Microtus*.

Palate normal; lower third molar without closed triangles; lower first molar normally with five closed triangles and nine salient angles; upper third molar normally with three closed triangles and seven or eight salient angles. Upper incisors not grooved. Mammaræ eight, four pectoral and four inguinal. Plantæ tubercles six; soles moderately hairy.



FIG. 38. *MICROTUS PENNSYLVANICUS*.

No. 424 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 5 times.

UPPER TOOTH ROW.
Enlarged 5 times.

256. pennsylvanicus. (*Mus*), Ord, Guthr. Geog., 1815, 2d ed., p. 292.

pratensis, Rafin., Am. Month. Mag., 1817, 11, p. 45.

noveboracensis, Rafin., Ann. Nat., 1820, p. 3.

palustris, Harl., Faun. Amer., 1825, p. 136.

riparius, Ord, Journ. Acad. Nat. Scien. Phila., 1825, 1v, p. 305.

albo-rufescens, Emmons, Rep. Quad. Mass., 1840, p. 60.

hirsutus, Emmons, Rep. Quad. Mass., 1840, p. 60.

nasutus, Aud. & Bach., Proc. Acad. Nat. Scien. Phil., 1841, p. 96.

fulva, Aud. & Bach., Proc. Acad. Nat. Scien. Phil., 1841, p. 96.

rufescens, DeKay, N. Y. Zool., 1842, 1, p. 85.

oneida, DeKay, N. Y. Zool., 1842, 1, p. 88.

dekayi, Aud. & Bach., N. Am. Quad., 1854, 111, p. 287.

longipilis, Kenn., Agric. Rep., U. S. Patent Office, 1856, p. 304.

rufidorsum, Baird, N. Am. Mamm., 1859, p. 526.

Type locality. Near Philadelphia, Pa.

Geogr. Distr. Atlantic coast westward to the Dakotas and Nebraska.

Genl. Char. Size large; tail more than one-third the length of head and body. Feet very large, scaly. Head pointed.

Color. Upper parts and sides reddish brown to yellow chestnut, mixed with black; lower sides yellowish brown; beneath whitish ash, tinged with brown. Feet and tail dusky, the latter paler beneath.

Measurements. Total length, 167-171; tail vertebræ, 44-46; hind foot, 21-24.

a.—nigrans. Rhoads, Proc. Acad. Nat. Scien. Phila., 1897, p. 307.

Type locality. Currituck, North Carolina.

Geogr. Distr. Coasts of southern Virginia and northern North Carolina.

Color. Summer Pelage. Above bister lined with black, beneath smoky gray. Tail, black above, sooty below; feet blackish.

Winter Pelage. Colors darker, dorsal area nearly black.

Measurements. Type. Total length, 175; tail vertebræ, 50; hind foot, 23; ear, 9.

b.—acadicus. (*Microtus*), Bangs, Amer. Natur., 1897, 31, p. 239.

Type locality. Digby, Nova Scotia.

Geogr. Distr. Nova Scotia and Prince Edward's Island.

Genl. Char. Smaller than *M. pennsylvanicus*.

Color. Winter Pelage. Above bister brown, shaded with russet, sparsely mixed with black; beneath dark gray washed with white.

Summer Pelage. Above yellowish bister lined with black; tail brownish black above, paler beneath; feet dusky plumbeous.

Measurements. Total length, 172; tail vertebræ, 49; hind foot, 20.

c.—modestus. (*Arvicola*), Baird, N. Am. Mamm., 1857, p. 535, Spec. juv.

insperatus, Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 347.

Type locality. Sawatch Pass (Cochetopa Pass), Rocky Mountains, Colorado.

Geogr. Distr. Rocky Mountains and the plains from New Mexico to British Columbia, and from the Black Hills, South Dakota, to central Idaho, and the plains of the Columbia.

Genl. Char. Equal in size to *M. pennsylvanicus*; ears shorter than fore foot; tail vertebræ scarcely longer than the head; middle upper molar with five triangles; last upper molar has one anterior, one interior and two exterior triangles, and a posterior bent crescent occupying nearly half the tooth. With the loop of this crescent there are five interior salient angles and three exterior. Anterior lower molar has five interior salient angles and the loop, and four exterior.

Color. Above, black hairs with yellowish brown tips, giving a fulvous tinge. Beneath, dark plumbeous tinged with hoary. Tail above dark brown; below hoary plumbeous. Feet dark brown.

Measurements. Total length, 93; tail vertebræ, 23; hind foot, 18.

d.—fontigenus. (*Microtus*), Bangs, Biol. Soc. Wash., 1896, p. 48.

Type locality. Lake Edward, Quebec.

Geogr. Distr. Quebec, Canada, west to Peninsula Harbor and Nepigon, north shore of Lake Superior.

Genl. Char. Size small, color dark, no rufous shades; rostrum slender, bullæ large.

Color. Above sepia brown mixed with black; beneath olive or smoky gray; tail black above, gray beneath.

Measurements. Total length, 151; tail vertebræ, 41.5; hind foot, 21.

e.—labradorius. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 88.

Type locality. Fort Chimo, Ungava, Labrador.

Geogr. Distr. Ungava, Labrador. Only known from the type locality.

Genl. Char. Skull flat; postorbital ridge prominent; nasals short, cuneate; first upper molar usually with a posterior lobe on either side; audital bullæ small.

Color. "Above dark brownish; belly whitish; tail bicolor; feet pale."

Measurements. Total length, 139; tail vertebræ, 39; hind foot, 20.

257. drummondi. (*Arvicola*), Aud. & Bach., N. Am. Quad. III, 1854, p. 166.

microcephalus, Rhoads, Proc. Acad. Nat. Scien. Phila., 1894, p. 286.

stonei, Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 5.

Type locality. Near Jasper House, Rocky Mountains, Alberta.

Geogr. Distr. Hudson Bay to Alaska, and from United States northern boundary to Fort Anderson, Northwest Territory.

Genl. Char. Size small; tail short. Skull narrow, slender.

Color. Summer Pelage. Above dark brown, suffused with pale fulvous and lined with black; dorsal area blackish brown, side grayer; beneath whitish gray, base of hair plumbeous; sides of nose and front of ears yellowish; feet silver gray; tail blackish brown above, grayish beneath. *Winter Pelage.* Paler; ears and nose more conspicuously yellow.

Measurements. Total length, 143-156; tail vertebræ, 33-39; hind foot, 17-19; ear, 8.5. Skull: occipito-parietal suture to end of nasals, 23; zygomatic breadth, 13.6; interorbital breadth, 13.6; width of brain case, 12; length of nasals, 7; incisors to post-palatal notch, 7.

258. aztecus. (*Arvicola*), Allen, Bull. Am. Mus. Nat. Hist., N. Y., 1893, p. 73.

Type locality. Aztec, New Mexico.

Geogr. Distr. Estes Park, Colorado, to Valley of San Juan River, New Mexico.

Genl. Char. Size large; tail short; skull very narrow. Interparietal twice as wide as long.

Color. Above grayish brown tinged with buff; beneath grayish white; feet dusky. Tail dusky brown above; white beneath.

Measurements. Total length, 146-170; tail vertebræ, 35-42; hind foot, 17.3-18.

259. enixus. (*Microtus*), Bangs, Amer. Natur., 1896, p. 1051.

Type locality. Hamilton Inlet, Labrador.

Geogr. Distr. Eastern coast of Labrador from Hamilton Inlet to Ungava Bay.

Genl. Char. Size medium, tail long; hind foot large; molars small, weak; incisors long, slender, projecting outward. Hip glands present in adult males.

Color. Above dark burnt umber brown, mixed with black; beneath dark gray; feet dusky; tail above black, beneath dark gray.

Measurements. Total length, 210; tail vertebræ, 67; hind foot, 22.5.

260. terraenovae. (*Microtus*), Bangs, Proc. Biol. Soc. Wash., 1894, p. 129.

Type locality. Codroy, Newfoundland.

Geogr. Distr. Newfoundland and Penguin Island.

Genl. Char. Size of *M. pennsylvanicus*, but with larger feet; tail more than twice the length of hind foot. Skull broad and short;

orbital constriction very considerable; rostrum narrow. First upper molar with spur at base of posterior angle.

Color. Above umber brown, mixed with black; beneath gray, with a median dark cinnamon streak. Tail above black, beneath gray. Feet grayish brown.

Measurements. Total length, 187; tail vertebræ, 54; hind foot, 24; ear, 12.

261. breweri. (*Arvicola*), Baird, N. Amer. Mamm., 1857, p. 525.

Type locality. Muskeget Island, Massachusetts.

Geogr. Distr. Known only from type locality.

Genl. Char. Size large; feet broad and stout; soles with six tubercles; brain case longer and wider than that of *M. pennsylvanicus*; interparietal longer antero-posteriorly, shorter transversely. Interparietal as wide as long.

Color. Above grayish yellow brown; under parts yellowish white. Feet white. Tail above yellowish brown, beneath yellowish white.

Measurements. Total length, 162-182; tail vertebræ, 44-54; hind foot, 22.3-24.

262. nesophilus. (*Microtus*), Bailey, Science, N. S. 1898, 111, p. 782.

insularis, Bailey, Proc. Biol. Soc. Wash., 1898, p. 86 (nec *Lemmus insularis* Nills).

Type locality. Great Gull Island, N. Y.

Geogr. Distr. Known only from type locality.

Genl. Char. "Size of *M. pennsylvanicus*, colors darker; skull shorter and wider, with spreading zygoma and deep prezygomatic notches." Interparietal wider than long.

Color. Above dark yellowish bister, below cinnamon.

Measurements. Skull: basal length, 26; zygomatic breadth, 16.2; mastoid, 12.3; length of molar series, 6.8 (Skin). Tail, 29; hind foot, 20.

263. montanus. (*Arvicola*), Peale, Mamm. U. S. Expl. Exped., 1848, p. 46.

longirostris, Baird, N. Am. Mamm., 1857, p. 530.

Type locality. Head waters of Sacramento River near Mount Shasta, California.

Geogr. Distr. Northern Utah, Nevada, northeastern California and eastern Oregon.

Genl. Char. Size moderate; ear long as forefoot; tail long, two-fifths the head and body. Last upper molar has three external salient angles; first lower molar has five interior and four exterior.

Color. Above dull yellowish brown mixed with black; sides lighter; beneath whitish ash, base of fur plumbeous; feet brownish white. Tail brown above, soiled white beneath.

Measurements. Total length, 122-192; tail vertebræ, 33-54; hind foot, 19.23; ear, 9-11.

a.—arizonensis. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 88.

Type locality. Springerville, Arizona.

Geogr. Distr. Eastern Arizona.

Genl. Char. Similar to *M. montanus*, but more ferruginous; palate flat, pits shallow; pterygoids thick.

Color. Above rusty brown; beneath white; feet dark grayish; tail blackish above, grayish below.

Measurements. Total length, 184; tail vertebræ, 55; hind foot, 20. Skull: basal length, 27.3; nasals, 8; zygomatic breadth, 16; mastoid, 12.2; length of upper molar series, 6.5.

b.—rivularis. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 96.

Type locality. St. George, Utah.

Geogr. Distr. Only known from the type locality.

Genl. Char. Larger and paler than *M. montanus*.

Color. Above dull bister lined with black; sides slightly paler; beneath whitish; feet grayish; tail blackish above, grayish below.

Measurements. Total length, 179; tail vertebræ, 48; hind foot, 23. Skull: basal length, 28.2; nasals, 8.3; zygomatic breadth, 17; mastoid, 13.3; length of upper molar series, 7.3.

264. nanus. (*Arvicola*), Merr., N. Am. Faun., No. 5, 1891, p. 63, pl. 11, fig. 5-6.

Type locality. Pahsimeroi Mountains, Idaho. Altitude, 9,350 feet.

Geogr. Distr. Rocky Mountains and other ranges from Central Idaho to Nevada and southern Colorado.

Genl. Char. Size small; ears small; antitragus large, and large fossa innominata; tail more than one-third the length of head and body. Skull: brain case narrow, high; parietal anteriorly subtruncate; middle upper molar without postero-internal loop.

Color. Above pale grizzled bister, mixed with black; sides ash gray; beneath grayish white. Tail above dusky, beneath whitish. Feet dusky.

Measurements. Total length, 151; tail vertebræ, 41; hairs, 7.5; hind foot, 18; ear from crown, 4.

n.—canescens. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 87.

Type locality. Conconully, Washington.

Geogr. Distr. Northern Washington and southern British Columbia.

Genl. Char. Similar to *M. nanus*, but paler. Skull: mastoid breadth greater; audital bullæ larger; molar pattern as in *M. nanus*; hip glands conspicuous in adult males.

Color. Above dark grayish; sides lighter gray; beneath white; feet dark gray; tail above blackish; grayish beneath.

Measurements. Total length, 149; tail vertebræ, 42; hind foot, 20. Skull: occipital condyles to anterior base of molars, 17.4; zygomatic breadth, 15; mastoid, 12.3; length of molar series, 63.

265. canicaudus. (*Microtus*), Miller, Proc. Biol. Soc. Wash., 1897, p. 67.

Type locality. McCoy, Oregon.

Geogr. Distr. Willamette Valley, Oregon, southern Washington on eastern slopes of the Cascade Mountains.

Genl. Char. Size about as *M. nanus*, but more yellow. The brain case is broader and deeper; audital bullæ flatter and more round.

Color. Above and sides umber brown mixed with black, darker on head and paler on sides; beneath grayish white tinged with yellowish; tail above whitish gray, beneath paler. Base of fur plumbeous.

Measurements. Average total length, 135; tail vertebræ, 33.7; hind foot, 20.

266. dutcheri. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 85.

Type locality. Big Cottonwood Meadows, near Mt. Whitney, California.

Geogr. Distr. Inyo and Tulare counties, eastern California. "Hudsonian zone of the southern Sierra Nevada."

Genl. Char. Size small; tail short; ears small; hip glands present in adult males.

Color. Above dark bister, hairs tipped with brown; beneath buffy brown; feet whitish; tail blackish above, whitish below.

Measurements. Total length, 167; tail vertebræ, 35; hind foot, 20.

267. nevadensis. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 86.

Type locality. Ash Meadows, Nye county, Nevada.

Geogr. Distr. Type locality and Pahrnagat Valley, Southern Nevada.

Genl. Char. Size large; tail short; colors dark; hip glands conspicuous in adult males; first upper molar with five closed triangles; second with four; sometimes there is a small inner lobe at base of posterior triangle; third with anterior crescent, three closed triangles and a posterior loop with two inner lobes.

Measurements. Total length, 210; tail vertebræ, 55; hind foot, 25.5. Skull: basal length, 32; nasals, 10.2; zygomatic breadth, 19.3; mastoid, 14.3; length of upper molar series, 8.

268. californicus. (*Arvicola*), Peale, Mamm. U. S. Expl. Exped., 1848, p. 46.

trowbridgi, Baird, N. Am. Mamm., 1857, p. 529.

Type locality. Shores of San Francisco Bay, California.

Geogr. Distr. "California, west of the Colorado Desert and the Sierra Nevada, and from Santa Isabel, San Diego county, California, to the Rogue River and Umpqua Valleys, Oregon."

Genl. Char. Ear five-eighths length of hind foot; tail twice as long as hind foot; posterior upper molar has two exterior and one interior triangle; the posterior crescent sends out a lobe near the bend; first upper molar has four external salient angles, and five internal, besides the anterior loop.

Color. Above pale yellowish brown mixed with black; sides lighter; beneath grayish white tinged with yellow; feet brownish gray; tail dark brown above, paler beneath.

Measurements. Total length, 170; tail vertebræ, 48; hind foot, 20; ear, 12.

a—vallicola. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 89.

Type locality. Lone Pine, Inyo county, California.

Geogr. Distr. Valley of Eastern California.

Genl. Char. Larger and darker than *M. californicus*; middle upper molar with lobe at base of fourth triangle often developed into a loop.

Color. Above dull sepia, lined with black, slightly suffused with yellowish; beneath smoky plumbeous; feet dusky; tail above blackish, below grayish.

Measurements. Total length, 200; tail vertebræ, 57; hind foot, 23.

b.—constrictus. Bailey, N. Am. Faun., 1900, No. 17, p. 36.

Type locality. Cape Mendocino, California.

Geogr. Distr. Coast region near Cape Mendocino.

Genl. Char. Smaller than *M. californicus* and grayer.

Color. Above buffy gray, beneath whitish. Tail, dull grayish, feet gray.

Measurements. Total length, average of four adults, 163; tail vertebræ, 55; hind foot, 21.5.

269. edax. (*Arvicola*), Le Conte, Proc. Acad. Nat. Scien. Phil., 1853, p. 405.

Type locality. Vicinity of San Francisco, California.

Geogr. Distr. Western and southern California.

Genl. Char. Ears large; tail two-fifths the length of head and body; plantar tubercles large; soles haired from heel to first tubercle.

Color. Above pale yellowish brown thinly mixed with black; sides paler; beneath soiled grayish white. Tail, brown above, dull white beneath.

Measurements. Total length, 217; tail vertebræ, 73; hind foot, 25.

270. scirpensis. (*Microtus*), Bailey, N. Am. Faun., 1900, No. 17, p. 38.

Type locality. Amargosa River, Inyo County, California.

Geogr. Distr. Known only from the type locality.

Genl. Char. Similar to *M. edax*; colors paler; middle upper molar with rounded open or closed posterior loop.

Color. Above dark buffy gray; beneath smoky gray. Tail, brown above, grayish beneath; feet brownish gray.

Measurements. Total length, 210; tail vertebræ, 67; hind foot, 25.

271. operarius. (*Arvicola*), Nelson, Proc. Biol. Soc. Wash., 1893, p. 139.

Type locality. St. Michaels, Norton Sound, Alaska.

Geogr. Distr. Coast tundras of Bering Sea from Cape Vancouver to Bering Straits, including Nelson, St. Michaels and Stewart Islands; Alaska eastward to Anderson River.

Genl. Char. Size small; tail one-third the length of head and body; color pale.

Color. Above pale fulvous or fawn faintly lined with black; sides paler; beneath grayish white. Tail, above dark brown, beneath white. Feet whitish.

Measurements. Total length, 104.5; tail vertebræ, 25.2; hind foot, 17.9; ear, 9.8. Juv?

272. macfarlani. (*Microtus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 25.

Type locality. Fort Anderson, north of Great Bear Lake, Arctic America.

Geogr. Distr. Arctic America east of the Mackenzie River.

Genl. Char. Size medium, tail short. Similar to *M. operarius*.

Color. Above dull fulvous brown and black; beneath whitish tinged with buff; hind foot brown; toes partly whitish. Tail, dusky above, whitish beneath.

Measurements. Skin. Tail, 29; hind foot, 18.5.

273. yakutatensis. (*Microtus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 22.

Type locality. Yakutat Bay, Alaska.

Geogr. Distr. Glacier Bay to Prince William Sound, Alaska.

Genl. Char. Size medium; tail very short, similar to *M. sitkensis*, but with shorter feet. Cranial characters as in *M. sitkensis*.

Color. Above grayish brown, black, and buffy fulvous; beneath whitish, or buffy white; feet whitish, soles black. Tail, above blackish, beneath whitish or buff.

Measurements. Total length, 172; tail vertebræ, 38; hind foot, 21.

274. kadiacensis. (*Microtus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 222.

Type locality. Kadiak Island, Alaska.

Geogr. Distr. Kadiak Island, Alaska.

Genl. Char. Similar to *M. sitkensis*, but smaller and paler. Teeth as in *M. sitkensis*, but first lower molars with only two closed loops on each side.

Color. Above pale grizzled brownish, suffused with pale fulvous, lined with black; under parts plumbeous washed with white. Tail, dusky above, white beneath. Feet grayish brown.

Measurements. Total length: "Average of five adult males, 188; tail vertebræ, 50; hind foot, 21."

275. unalascensis. (*Microtus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 222.

Type locality. Unalaska, Alaska.

Geogr. Distr. Unalaska Island, Alaska.

Genl. Char. Similar to *M. kadiacensis*, but darker; audital bullæ shorter; first lower molar with two closed and two open internal loops, and two closed external.

Color. Above yellowish brown; beneath plumbeous washed with whitish. Tail, black above, white below. Feet grayish.

Measurements. Total length, 122; tail vertebræ, 28; hind foot, 19.

a.—popofensis. (*Microtus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 22.

Type locality. Popof Island, Shumagin Group, Alaska.

Genl. Char. Similar externally to *M. unalascensis*, but cranium

different. Anterior end of frontal narrow and without a lachrymal tubercle.

Color. Above yellowish brown, darkest in middle of back and lined sparsely with black; sides paler yellowish brown; beneath plumbeous washed with white, with buff space on breast. Feet and legs dark brownish. Tail, dusky above, white beneath.

Measurements. Total length. Type, 188; tail vertebræ, 43; hind foot, 22. "Average of three topotypes, 165, 38, 22.4."

276. sitkensis. (*Microtus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 221.

Type locality. Sitka, Alaska.

Geogr. Distr. Baranof Island, Alaska.

Genl. Char. Size equal to *M. unalascensis*; tail short; skull long and narrow; brain case rounded; audital bullæ large, elongated; incisive foramina narrow, not reaching molars; first lower molar with three internal closed loops, and two external, the anterior loop with one internal salient angle, and no external. Third lower molar has four inner and four outer salient angles, and three closed triangles.

Color. Above grizzled brown suffused with reddish brown; brightest on rump, beneath plumbeous washed with ochraceous buff. Tail, above black, below white. Feet dusky.

Measurements. Total length, 155; tail vertebræ, 42; hind foot, 23. Skull: basal length, 25; zygomatic breadth, 14; palatal length, 13; interorbital constriction, 4.2.

277. innuitus. (*Microtus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 21.

Type locality. St. Lawrence Island, Bering Sea.

Genl. Char. Skull and parts of skeleton alone known; "cranium large; zygomata heavy, bowed outward, anterior roots standing outward and forward when seen from above; jugals slightly expanded; brain case squarely truncate anteriorly; nasals large, cuneate; rostrum massive, prominent lip at border of anteorbital foramen; audital bullæ large; incisors produced and protruding. Hind molar with three closed triangles; first molar with four, two on a side."

Measurements. "Tail vertebræ, 43-45; hind foot, 22-24. Skull: basal length, 32.5; zygomatic breadth, 19.5; mastoid breadth, 15.5; nasals, 9; molar series, 7.2." (Merr., l. c.)

278. abbreviatus. (*Microtus*), Miller, Proc. Biol. Soc. Wash., 1899, p. 13.

Type locality. Hall Island, Bering Sea.

Geogr. Distr. Only known from type locality.

Genl. Char. Size rather large; tail shorter than hind foot; plantar tubercles six; enamel pattern as in *M. arvalis*, Europe.

Color. Above pale yellowish brown, rufous on top of head and on rump, the plumbeous bases of the under fur giving a darkish tone to the upper parts; side pale buff, grading into the yellowish white of the under parts. Face yellowish rufous, darkest on upper lips; feet whitish. Tail, above like back, beneath buff.

Measurements. Total length, 160; tail vertebræ, 26; hind foot, 20. Taken in the flesh from a specimen in the Field Museum, obtained by the author on Hall Island, Bering Sea, July 14, 1899.

a.—fisheri. (*Microtus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 23.

Type locality. St. Matthew Island, Bering Sea.

Genl. Char. "Similar to *M. abbreviatus*, but yellow suffusion even more intense, particularly on belly; nasals and rostrum (above) decidedly longer, zygomata more strongly bowed outward; bullæ broader, less pointed anteriorly, and less flattened on outer side." (Merr., l. c.)

Measurements. Total length, 178; tail vertebræ, 32; hind foot, 24.

279. townsendi. (*Arvicola*), Bach., Journ. Acad. Nat. Scien. Phil., 1839, p. 60.

occidentalis. Peale, U. S. Expl. Exped., Mamm., 1848, p. 45.

Type locality. Lower Columbia River, Oregon, near mouth of the Willamette.

Geogr. Distr. Port Moody, British Columbia, to the Willamette Valley and Taquina Bay, Oregon.

Genl. Char. Size very large; ears two-thirds the length of hind foot; tail less than half the length of head and body. Middle upper molar has four triangles; last upper molar has one interior and two exterior closed triangles, and one anterior spherical triangle; anterior lower molar has four salient angles on either side and three exterior and three interior triangles.

Color. Above yellowish rusty brown lined with black; sides paler with less black. Under parts soiled ashy white tinged with brownish; feet pale brown. Tail, dark brown above, paler beneath.

Measurements. Total length, 190-226; tail vertebræ, 66; hind foot, 25-26; ear, 15.

280. tetramerus. (*Arvicola*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 283.

Type locality. Beacon Hill Park, Victoria, British Columbia.

Geogr. Distr. Vancouver Island.

Genl. Char. Size medium, tail long; middle upper molar wanting fifth section.

Color. Similar to *M. townsendi*. Above grizzled blackish brown; below ash; feet grayish brown; tail above like back, below like under parts.

Measurements. Total length, 170; tail vertebræ, 50; hind foot, 23.

281. longicaudus. (*Arvicola*), Merr. Amer. Nat., 1888, p. 934.

Type locality. Custer, Black Hills, South Dakota.

Geogr. Distr. Western South Dakota, Wyoming.

Genl. Char. Antitragus closing like meatus; tail very long.

Color. Above and sides bister, grizzled with rusty on back; sides grayish, beneath buffy gray; feet plumbeous; tail blackish above, whitish beneath.

Measurements. Total length, 185; tail vertebræ, 65; hind foot, 21.

282. mordax. (*Arvicola*), Merr., N. Am. Faun., No. 5, 1891, p. 61, pl. 11, fig. 3-4.

vellerosus, Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 7.

cautus, Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 7.

Type locality. Sawtooth or Alturus Lake, east foot of Sawtooth Mountain, Idaho.

Geogr. Distr. "In Rocky Mountains and contiguous ranges from latitude 60° to northern New Mexico, and in the Cascades of Sierra Nevada to Kaweah and Kern rivers, California."

Genl. Char. Similar to *M. longicaudus*, but larger; tail longer, ears smaller; skull with processes and ridges more developed than in allied species.

Color. Above pale grayish bister, lined with black; sides clear gray; under parts and feet whitish. Tail dark above, whitish below; feet plumbeous.

Measurements. Total length, 200; tail vertebræ, 77; hind foot, 22; ear, 10.

283. macrourus. (*Microtus*), Merr., Acad. Nat. Scien. Phil., 1898, p. 353.

Type locality. Lake Cushman, Olympic Mountains, Washington.

Geogr. Distr. Olympic Mountains, northwest Washington, and Alaska to Yakutat.

Genl. Char. Similar to *M. mordax*, but larger; tail longer; hind feet larger; color darker.

Color. Above brownish bister, grizzled; sides paler; beneath whitish, base of hairs plumbeous; tail dusky above, whitish below; tip sometimes white. Feet plumbeous.

Measurements. Average total length, 204; tail vertebræ, 80; hind foot, 24. Type specimen: Total length, 220; tail vertebræ, 88; hind foot, 24.3.

- 284. angusticeps.** (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 86.

Type locality. Crescent City, California.

Geogr. Distr. Coast region of northwestern California and southwestern Oregon.

Genl. Char. Skull narrow; audital bullæ small; nasals projecting in front of incisors; enamel pattern of teeth like that of *M. mordax*.

Color. Above dark bister lined with black; sides paler; beneath creamy white; feet plumbeous gray; tail above blackish, below white.

Measurements. Total length, 170; tail vertebræ, 56; hind foot, 22. Skull: basal length, 23.4; nasals, 7.6; zygomatic breadth, 13.5; mastoid, 10.8; length of upper molar series, 6.

- 285. alticola.** (*Arvicola*), Merr., N. Am. Faun., No. 3, 1890, p. 67, pl. 5 and 6.

Type locality. Little Spring, San Francisco Mountain, Arizona. Altitude, 8,200 feet.

Geogr. Distr. San Francisco Mountain, northwestern Arizona.

Genl. Char. Size rather large; ears large; tail long.

Color. Above dark bister, tinged with pale reddish brown and lined with black; beneath hoary plumbeous; feet grayish; tail dark brown above, grayish brown below.

Measurements. Total length, 170; tail vertebræ, 56; hind foot, 20; ear, 8.

- a.—leucophaeus.* (*Arvicola*), Allen, Bull. Am. Mus. Nat. Hist. N. Y., 1894, p. 320.

Type locality. Graham Mountains, Arizona.

Geogr. Distr. Graham Mountains, southeastern Arizona.

Genl. Char. Size medium; tail less than one-half the length of head and body. Skull: brain-case broad and flat; interorbital region very broad; angle of mandible greatly developed.

Color. Above pale reddish brown lined with black and tinged with gray; sides gray with less black; beneath whitish gray; tail above brown, whitish below. Feet dusky washed with gray.

Measurements. Total length, 173; tail vertebræ, 50; hind foot, 22.5; ear, 15.

- 286. mogollonensis.** (*Arvicola*), Mearns, Bull. Am. Mus. Nat. Hist., N. Y., 11, 1890, p. 283.

Type locality. Baker's Butte, Mogollon Mountains, central Arizona.

Geogr. Distr. Plateau of central Arizona.

Genl. Char. Size medium; tail less than half the length of head and body.

Color. Above yellowish brown and gray; sides fulvous; beneath grayish, washed with pale fulvous; feet and tail grayish.

Measurements. Total length, 121-131; tail vertebræ, 31; hind foot, 18.

287. xanthognathus. (*Arvicola*), Leach (nec Harlan), Zool. Misc., 1814, p. 60, pl. 26.

Type locality. Hudson Bay.

Geogr. Distr. "Northwestern Canada from Central Alberta to Arctic coast and west to central Alaska."

Genl. Char. Ears large; tail shorter than head; posterior half of soles hairy.

Color. Above dark brown and black; sides paler; beneath silvery bluish gray; two patches anterior to shoulders blackish gray; blackish brown stripe on nose between two reddish brown stripes. Tail beneath whitish.

Measurements. Dry skin. Total length, 210; tail vertebræ, 50; hind foot, 27.

288. chrotorrhinus. (*Microtus*), Miller, Proc. Bost. Soc. Nat. Hist., 1894, p. 190.

Type locality. Mount Washington, New Hampshire.

Geogr. Distr. The Catskills. New Hampshire northward into New Brunswick to Trowser's Lake and central Quebec.

Genl. Char. Similar in size to *M. pennsylvanicus*; hind feet smaller; posterior upper molar with three nearly closed outer triangles; third lower molar with five closed triangles, five inner and five outer salient angles and double-lobed posterior loop.

Color. Upper parts and sides, between raw umber and broccoli brown mixed with black; muzzle ochraceous; sides of neck and head tinged with same color; beneath silvery gray; tail above grayish brown, beneath hair brown; feet silvery gray, soles covered with grayish hairs.

Measurements. Total length, 165; tail vertebræ, 45; hind foot, 19.4; ear, 13.8.

a.—rampus. (*Microtus*), Bangs, Proc. Biol. Soc. Wash., 1898, p. 188.

Type locality. Black Bay, Labrador.

Geogr. Distr. Known only from type locality.

Genl. Char. Similar to *M. chrotorrhinus*; paler; skull more slender and constricted between orbits; rostrum more slender; audital bullæ flatter; less inflated.

Color. Above pale grayish raw umber, mixed with black on back; nose and face pale tawny ochraceous; under parts and feet gray; tail above dusky brown, paler and grayer beneath.

Measurements. "Average total length of four adults, 159.75; tail vertebræ, 46; hind foot, 21.25; ear, 12.5."

289. borealis. (*Arvicola*), Richards, Zool. Journ., 1828, p. 517. Rhoads, Proc. Acad. Nat. Scien., 1894, p. 286.

Type locality. Great Bear Lake, Hudson Bay Territory.

Geogr. Distr. Arctic America. Limits not known.

Genl. Char. Small; tail shorter than head. Middle upper molar without posterior fold. Posterior end of frontals long, slender, strap-shaped; anterior corners of parietals pointed.

Color. Above blackish gray; beneath lead gray; tail clove brown above, grayish white beneath; feet clove brown mixed with white; claws whitish.

Measurements. Total length, 139; tail vertebræ, 25; hind foot, 15; ear, 6.

B. *Lagurus*.

Audital bullæ very large, projecting backward behind the plane of the occiput. Palate normal; third lower molar with all triangles closed; upper third molar with two closed triangles and posterior loop. Plantar tubercles, 5; mammæ, 8; inguinal, 4; pectoral, 4.

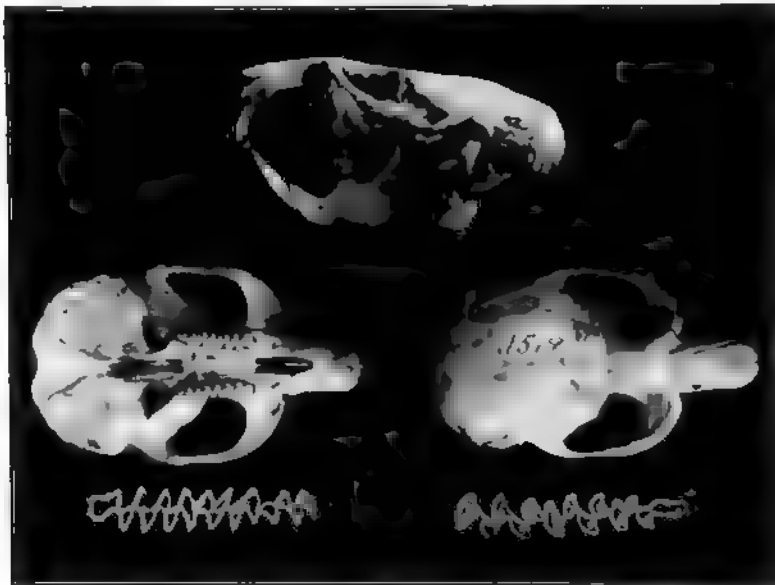


FIG. 39. *MICROTUS (LAGURUS) CURTATUS*.

No. 1519 Field Columbian Museum Coll. Enlarged $\frac{1}{6}$.

LOWER TOOTH ROW.
Enlarged 6 times.

UPPER TOOTH ROW.
Enlarged 6 times.

290. pauperrimus. (*Arvicola*), Cooper, Amer. Nat., vol. 11, 1868, p. 535.

Type locality. Plains of the Columbia, near Snake river, Washington.

Geogr. Distr. "Eastern Washington and Oregon, central Idaho and north slope of the Uinta Mountains, Utah, in transition zone."

Genl. Char. Small; ears small, nearly hidden in hair; feet hairy; tail very short. Skull: small, flat, broad and depressed anteorbitally; nasals short; incisive foramina extend beyond the anterior plane of the first molars.

Color. Upper parts gray tinged with buffy, and lined with black; under parts whitish buff. Tail above gray, below whitish buff. Feet whitish.

Measurements. Total length, 116; tail vertebræ, 20; hind foot, 16; ear, 8.

291. curtatus. (*Arvicola*), Cope, Proc. Acad. Nat. Scien. Phil., 1868, p. 2.

Type locality. Pigeon Spring, Mount Magruder, Nevada.

Geogr. Distr. Eastern California north of Death Valley, western Nevada; limits of range not known.

Genl. Char. Size very small; tail and hind feet very short; ears prominent. Anterior lower molar with three internal and two external triangles, and one posterior triangle. Tail shorter than hind foot.

Color. Above light grayish brown; beneath white; feet white. Tail above grayish brown, beneath white.

Measurements. Total length, 118; tail vertebræ, 19; hind foot, 18; ear, 11.

292. pallidus. (*Arvicola*), Merriam, Amer. Nat., 1888, p. 703.

Type locality. Fort Buford, North Dakota.

Geogr. Distr. North Dakota, Montana north to Calgary, Alberta.

Genl. Char. Size medium; tail very short, pencil long; ears well haired, medium.

Color. Above pale buffy gray mixed with black; beneath white, plumbeous base of fur visible. Tail indistinctly bicolor.

Measurements. Total length, 121-133; tail vertebræ, 20-23; foot, 18-18.25; ear from crown, 5-6.

O. Pedomys.

Palate normal; third lower molar without closed triangles; claws small, those of front feet always shortest; plantæ tubercles, 5; first

lower molar with three closed triangles and eight or nine salient angles; third upper molar with two closed triangles and six salient angles; mammæ, 6; inguinal, 4; pectoral, 2. Soles thickly haired.



FIG. 40. *MICROTUS (PEDOMYS) AUSTERUS*.

No. 216 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 7 times.

UPPER TOOTH ROW.
Enlarged 6 times.

293. *austerus*. (*Arvicola*), Le Conte, Proc. Acad. Nat. Scien. Phil., 1853, p. 405.

?*Hypudæus ochrogaster*. Wagn. Suppl. Schreb. Säugt., 111, 1843, p. 592.—Allen, Bull. Am. Mus. Nat. Hist. N. Y., 1898, p. 458.

cinnamomea, Baird, N. Am. Mamm., 1857, p. 541.

Type locality. Wisconsin.

Geogr. Distr. Mississippi Valley, southern Wisconsin to southern Missouri and Oklahoma; west to eastern Kansas and Nebraska.

Genl. Char. Size large; ears short; fore feet more than half as long as the hinder; half of sole hairy; tail short, less than one third head and body. Posterior upper molar with three salient angles on either side; anterior lower molar with five internal and four external salient angles, besides the anterior loop.

Color. *Winter Pelage*. Above grayish cinnamon, lined with black; sides paler; beneath pale cinnamon. Under fur plumbeous; tail blackish brown above, beneath pale cinnamon. Feet grayish cinnamon. *Summer Pelage*. Darker above, paler fulvous beneath.

Measurements. Total length, 125-170; tail vertebræ, 30-40; hind foot, 17.21; ear, 11.

- 294. ludovicianus.** (*Microtus*), Bailey, N. Am. Fauna, No. 17, 1900, p. 74.

Type locality. Iowa, Calcasieu Parish, Louisiana.

Geogr. Distr. Coast prairie, southwestern Louisiana.

Genl. Char. Similar to *M. austerus*; rostrum and nasals more slender; bullæ larger.

Color. Above dark gray; beneath fulvous; tail dusky above, buffy beneath; feet dusky.

Measurements. Total length, average two adults, 164; tail vertebræ, 33; hind foot, 18.5.

- 295. haydeni.** (*Arvicola*), Baird, N. Am. Mamm., 1857, p. 543.

Type locality. Fort Pierre, South Dakota.

Geogr. Distr. Fort Pierre and the Black Hills, South Dakota, to the North Platte River, western Nebraska; eastern Colorado and Wyoming, and southern Montana.

Genl. Char. Larger than *M. austerus*; tail not twice the length of hind foot; ears short, half as long as hind foot; soles hairy for half the length; last upper molar with two interior and one exterior triangle.

Color. Above gray yellowish brown mixed with black; sides grayer and less black; beneath grayish yellow white, tinged with pale yellowish rusty. Feet pale rusty yellowish white. Tail above brown, beneath pale yellowish rusty.

Measurements. Total length, 153-180; tail vertebræ, 38-47; hind foot, 20-22.

- 296. minor.** (*Arvicola*), Merr., Amer. Nat., 1888, p. 600.

Type locality. Bottineau, Turtle Mountain, North Dakota.

Geogr. Distr. From Edmonton, Alberta, to northwestern North Dakota, and southeastwardly to Minneapolis, Minn.

Genl. Char. Similar to *M. austerus*; smaller.

Color. Above grizzled gray, beneath whitish washed with cinnamon. Tail bicolor, dusky above, buffy beneath. Feet gray.

Measurements. Total length, 133; tail vertebræ, 36; hind foot, 16.5.

D. *Pitymys*.

Palate normal; lower third molar without closed triangles, but with three transverse loops; lower first molar with three closed and two open triangles and nine salient angles; upper third molar with two closed triangles and six salient angles. Mammæ, 4 inguinal; plantar tubercles, 5; soles hairy.

FIG. 41. *MICROTUS (PITYMYS) PINETORUM*.

No. 454 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.

Enlarged 5 times.

UPPER TOOTH ROW.

Enlarged 5 times.

297. *pinetorum*. (*Psammomys*), Le Conte, Ann. Lyc. Nat. Hist. N. Y., 111, 1829, p. 132, pl. 2.

Type locality. Eastern Georgia. Riceboro?

Geogr. Distr. Georgia, North and South Carolina, and Florida.

Genl. Char. Ears short, naked, concealed in the fur; legs short; tail short, hairy. Two middle triangles of third upper molar sometimes confluent.

Color. Above russet brown; flanks paler, beneath plumbeous washed with russet. Feet ash, tinged with flesh color.

Measurements. Total length, 116-126; tail vertebrae, 21; hind foot, 15-16.5.

a.—scalopsoides (*Arvicola*), Aud. and Bach., Proc. Acad. Nat. Scien. Phil., 1841, p. 97.

apella, Le Conte, Proc. Acad. Nat. Scien. Phila., 1853, p. 405.

kennicotti, Baird, N. Am. Mamm., 1857, p. 547.

Type locality. Long Island, New York.

Geogr. Distr. Southern New York grading along the coast into *M. pinetorum*; westward to Illinois.

Genl. Char. Tail short, not as long as the head; fur short, silky, lustrous.

Color. Above brownish chestnut, hairs tipped with dusky, sides lighter; beneath light cinerous, fur at base plumbeous. Feet brownish gray. Tail, above sooty, beneath grayish.

Measurements. Total length, 120-125; tail, 20; hind foot, 14-16.

b.—auricularis. (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 90.

Type locality. Washington, Mississippi.

Geogr. Distr. Alleghany Mountains to the Mississippi River.

Genl. Char. Size small; ears large, above the fur; colors dark; pterygoid fossa U-shaped; third upper molar with three closed tri-

angles; first lower molar with five pair of reëntrant angles meeting behind anterior loop.

Color. Above chestnut, hairs tipped with dusky; under parts paler. Tail similar to the back, unicolor. Feet brownish.

Measurements. Total length, 120; tail vertebræ, 22; hind foot, 16. Skull: basal length, 22.3; nasals, 7; zygomatic breadth, 15.2; mastoid, 12.3; alveolar length of molar series, 6.

298. *memoralis.* (*Microtus*), Bailey, Proc. Biol. Soc. Wash., 1898, p. 89.

Type locality. Stilwell, Boston Mountains, Indian Territory.

Geogr. Distr. Indian Territory and Arkansas to Council Bluffs, Iowa.

Genl. Char. Size large; ears large; third upper molar with three tightly closed triangles and an irregular posterior loop; first lower molar with opposite reëntrant angles meeting behind the anterior loop.

Color. Above dull chestnut lined with black on back and rump; sides paler, beneath cinnamon rufous; under fur plumbeous. Tail, like back above, and like belly beneath. Feet pale buff.

Measurements. Average total length, 135; tail vertebræ, 25; hind foot, 18.1. Skull: basal length, 25.3; nasals, 7.7; zygomatic breadth, 16.5; mastoid, 13.4.

B. *Chilotus*.

Palate normal; lower third molar normally without closed triangles; lower first molar with five closed triangles and nine or ten salient angles; upper third molar with two or three closed triangles and six salient angles. Mammæ eight, four pectoral, four inguinal. Plantæ tubercles, five; soles hairy.



FIG. 42. *MICROTUS (CHILLOTUS) OREGONI*.

No. 289 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 5 times.

UPPER TOOTH ROW.
Enlarged 5 times.

299. oregoni. (*Arvicola*), Bachm., Journ. Acad. Nat. Scien. Phila., 1839, viii, p. 60.

morosus. Elliot, Pub. Field Columb. Mus., 1899, 1, p. 227, Zool.

Type locality. Astoria, Oregon.

Geogr. Distr. Pacific Coast region from northern California to Puget Sound.

Genl. Char. Size small; tail long, ears prominent. Skull: brain case rather flat and narrow; interparietal large, squarely rectangular; zygomata considerably bent outward.

Color. Above brownish bister; under parts buffy. Tail, blackish above, paler below.

Measurements. Total length, 140; tail vertebræ, 42; hind foot, 17.

300. serpens. (*Microtus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 75.

Type locality. Agassiz, British Columbia.

Geogr. Distr. "Southern British Columbia and northern Washington, between the Cascade Mountains and Puget Sound."

Genl. Char. Tail shorter than that of *M. oregoni*, color darker.

Color. Summer Pelage. Above very dark brown, dusky on lower back and everywhere mixed with black; under parts deep plumbeous, belly washed with buffy. Tail, dusky above, whitish below.

Winter Pelage. Paler above; fur thinner, ears projecting.

Measurements. Total length, 130; tail vertebræ, 31; hind foot, 18.

301. bairdi. (*Microtus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 74.

Type locality. Glacier Peak, Crater Lake, Oregon. Altitude, 7,800 feet.

Geogr. Distr. Known from type locality only.

Genl. Char. Size small, ears and tail short; colors pale.

Color. Above pale grayish bister, tinged with reddish brown; under parts whitish. Tail, dark above, whitish beneath. Feet whitish.

Measurements. Total length, 131; tail vertebræ, 33; hind foot, 17.5.

F. *Arvicola*.

Palate slightly abnormal; lower third molar with occasional closed triangles; first lower molar normally with three to five closed triangles and seven to nine salient angles; upper third molar normally with two or three closed triangles, and six to eight salient angles. Mammæ, eight, four pectoral and four inguinal. Plantar tubercles, five; sole almost naked. Musk glands present on sides of body. (Miller.)

302. richardsoni. (*Arvicola*), De Kay, N. Y. Zool., 1842, 1, p. 91.

riparius, Richards. (nec Ord.), Faun. Bor. Amer., 1829, p. 120.

Type locality. Arctic regions "foot of Rocky Mountains," Rich. Jasper House, Alberta, Canada.

Geogr. Distr. Vicinity of Jasper House and of Henry House, Alberta, Canada.

Genl. Char. Very large. Tail about as long as head; incisors very large.

Color. Above dusky dark brown; sides paler; beneath bluish gray; margin of upper lip, chin and feet white. Tail above dark brown, beneath whitish.

Measurements. Total length, 208-230; tail vertebræ, 50-61; hind foot, 28.



FIG. 43. *MICROTUS (ARVICOLA) MACROPUS.*

No. 4316 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.

Enlarged 4 times.

UPPER TOOTH ROW.

Enlarged 4 times.

a.-macropus. (*Arvicola*), Merr., N. Am. Faun., No. 5, 1891, p. 60.

Type locality. Pahsimeroi Mountains, Idaho.

Geogr. Distr. Rocky Mountains from the Wasatch to Canada, the Wind River range of Wyoming, the Blue Mountains of Oregon, and intermediate ranges. High elevations.

Genl. Char. Size smaller than *M. richardsoni*; tail one-third the length of head and body; hind feet large. Third upper molar with a terminal loop, often recurved.

Color. *Summer Pelage.* Above grayish bistre lined with black, sides paler; beneath ash gray, base of hairs plumbeous. Tail dusky above, whitish below. Feet dusky. *Winter Pelage.* Paler above, white beneath.

Measurements. Total length, 220; tail vertebræ, 71; hind foot, 26; ear, 8.

b.—irvicoloides. (*Aulacomys*), Rhoads, Amer. Natur., 1894, xxviii, p. 183.

principalis, Rhoads, Amer. Nat., 1895, xxix, p. 940.

Type locality. Lake Kichelos, Kittitas county, Washington. Altitude, 8,000 feet.

Geogr. Distr. Cascade range, Oregon and Washington.

Genl. Char. Size large; tail less than half the length of body and head; premaxillaries extending beyond nasals.

Color. Summer Pelage. Above reddish brown lined with black; beneath hoary plumbeous, throat lighter. Tail blackish above, whitish beneath; feet blackish; whiskers black. *Winter Pelage.* Darker than summer pelage; belly nearly white.

Measurements. Total length, 197-253; tail vertebræ, 70-81; hind foot, 27-29.3; ear, 10.

G. Neofiber.

Neofiber. True, Science, 1884, 18, p. 34.

Skull and dentition as in *Fiber*. Feet normal; toes not bent laterally at an angle with the sole; tail round. (True, l. c.) Plantar tubercles, five; side glands conspicuous.

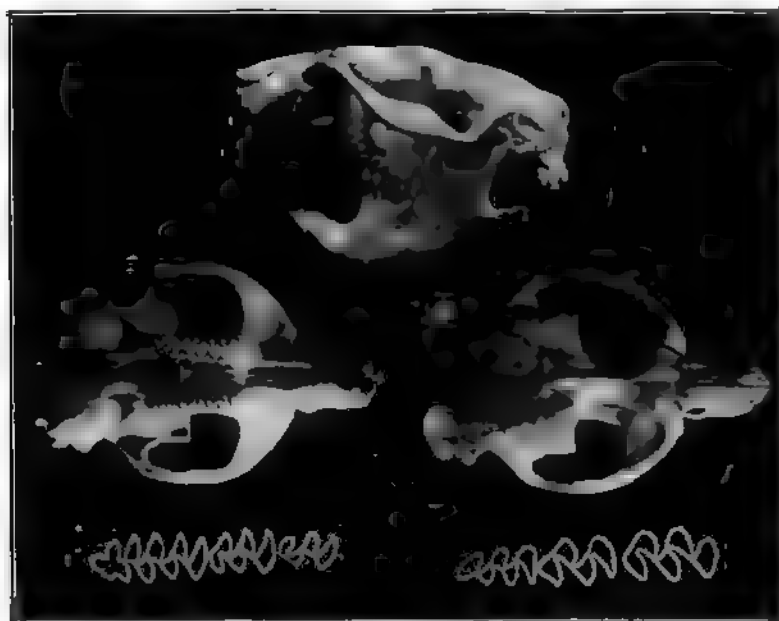


FIG. 44. *MICROTUS (NEOFIBER) ALLENI*.

No. 572 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 3 times.

UPPER TOOTH ROW.
Enlarged 3 times.

303. alleni. (*Neofiber*), True, Science, 1884, iv, p. 347. Id. Proc. U. S. Nat. Mus. Wash., 1884, p. 170.

Type locality. Georgiana, Merritt's Island, Brevard county, Florida.

Geogr. Distr. Eastern Florida, from Indian River on the north to Eden on the south, and to Gainesville in the interior. The limits of this species are not exactly known, and they may be beyond the boundaries named.

Genl. Char. Those of the genus. Size large; hind feet moderate, not equaling twice the length of the fore feet; soles naked, smooth, narrow; toes not inclined laterally at an angle with the soles; only slightly webbed; tail round, tapering gradually to the tip. Palate very short.

Color. Above rufous lined with black, hairs lead color at base; head darker; base of hairs behind shoulders, white; beneath light rufous, lead color at base of hair; chin, throat, inside of legs, white or tinged with rufous. Tail and feet dark brown. Young, maltese inclining to blackish on the back, pale plumbeous beneath.

Measurements. Total length, 327; tail vertebræ, 125; hind foot, 39.

54. Synaptomys.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

C. H. Merriam, *Revision of the genus, Synaptomus*, Proc. Biol. Soc. Wash., 1896, pp. 56-64.

Synaptomys. Baird, N. Am. Mamm., 1857, p. 558. Type *S. cooperi*, Baird.

Inferior molars with well defined enamel loops on outer side; superior incisors longitudinally grooved on outer edges; posterior end of palate without median projection.

A. Synaptomys.

304. cooperi. (*Synaptomus*), Baird, Mamm. N. Am., 1857, p. 558.

stonei, Rhoads, Amer. Nat., 1893, p. 53.

Type locality. Unknown. Southern New York or northern New Jersey?

Geogr. Distr. Eastern Massachusetts to Minnesota, south to North Carolina, Tennessee, Indiana, Iowa. Boreal and Transition Zones.

Genl. Char. Similar in appearance to *Microtus pennsylvanicus*, but tail much shorter.



FIG. 45. SYNAPTOMYS COOPERI.

No. 350 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 5 times.UPPER TOOTH ROW.
Enlarged 5 times.

Color. Above mixed grizzled gray and yellowish brown, lined with black; under parts whitish. Tail brown above, whitish below.

Measurements. Total length, 118; tail vertebræ, 17.5; hind foot, 18.

305. fatuus. (*Synaptomys*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 47.

Type locality. Lake Edward, Prov. Quebec, Canada.

Geogr. Distr. Lake Edward to Victoria County, New Brunswick, and Godbout, Quebec, and west to Peninsula Harbor, north-eastern Lake Superior, Ontario.

Genl. Char. Similar to *S. cooperi*, but smaller; upper incisors **NATURAL**

Color. Above grizzly yellowish brown mixed with black; under parts whitish or slate gray, tinged with buff on the belly; feet drab. Tail slightly paler beneath.

Measurements. Total length, 124; tail vertebræ, 18; hind foot, 18.7.

306. heialetes. (*Synaptomys*), Merr., Proc. Biol. Soc. Wash., 1896, p. 59.

Type locality. Dismal Swamp, Virginia.

Geogr. Distr. Only known from type locality.

Genl. Char. Similar to *S. cooperi*, larger feet and head, longer tail; rostrum and mandible broader.

Color. Above yellowish brown and grizzled gray mingled with black; under parts whitish gray. Tail brownish above, whitish below.

Measurements. Total length, 125; tail vertebræ, 22; hind foot, 20.

α.—fossii. (*Synaptomys*), Merr., Proc. Biol. Soc. Wash., 1896, p. 60.

Type locality. Neosho Falls, Kansas.

Geogr. Distr. Kansas, limits of range undetermined.

Genl. Char. Similar to *S. helaletes*, redder; rostrum longer; auditory bullæ smaller.

Color. Type (alcoholic specimens), color uncertain, probably more reddish brown than *S. cooperi*.

Measurements. Total length, 120; tail vertebræ, 20.5; hind foot, 19 (Merr.).

B. *Miotomys*.

Miotomys. True, Proc. U. S. Nat. Mus., 1894, p. 242. Type *M. innuitus*, True.

Inferior molars without enclosed enamel loops on outer side. Molars rootless; incisors broadly grooved on the bevel; posterior end of palate with strongly marked median projection.



FIG. 46 SYNAPTOMYS (MICTOMYS) INNUITUS.

No. 24729 U. S. National Museum Coll. Enlarged $\frac{1}{4}$.

UPPER TOOTH ROW.
Enlarged 4 times.

LOWER TOOTH ROW.
Enlarged 4 times.

307. innuitus. (*Miotomys*), True, Proc. U. S. Nat. Mus. Wash., 1894, p. 242.

Type locality. Fort Chimo, Ungava, Labrador.

Geogr. Distr. Labrador, limits unknown.

Genl. Char. Similar to *S. cooperi*; tail very short.

Color. "Above grayish brown; beneath gray; face pale brown; lips, end of nose and chin white; feet pale brown; tail brown above, white below." (True.)

Measurements. Total length, 115; tail vertebræ, 17; hind foot, 17.5.

- 308. sphagnicola.** (*Synaptomys*), Preble, Proc. Biol. Soc. Wash., 1899, p. 43.

Type locality. Fabyans, Mt. Washington, New Hampshire.

Geogr. Distr. White Mountains, New Hampshire; extent of range unknown.

Genl. Char. Larger than *S. innuitus*, with longer hind feet and tail; skull larger in all its proportions.

Color. Above sepia brown mixed with black; fur blackish slate at base; side glands indicated with white; under parts grayish white; hairs on cheeks and at base of ears light chestnut; tail above sepia brown, beneath grayish white.

Measurements. Total length, 132; tail vertebræ, 17; hind foot, 17.5.

- 309. wrangeli.** (*Synaptomys*), Merr., Proc. Biol. Soc. Wash., 1896, p. 63.

Type locality. Wrangel, Alaska.

Geogr. Distr. Southwestern Alaska, limits not known.

Genl. Char. Similar to *S. innuitus*, but larger; tail and hind foot longer; skull narrower.

Color. Above grizzled grayish brown tinged with yellow; under parts whitish plumbeous. Tail brownish above, whitish below, tip darker.

Measurements. Total length, 122; tail vertebræ, 23; hind foot, 19.

- 310. dalli.** (*Synaptomys*), Merr., Proc. Biol. Soc., 1896, p. 62.

Type locality. Nulato, Alaska.

Geogr. Distr. Valley of the Yukon, western Alaska. Limits of range unknown.

Genl. Char. Cranial characters different from *S. wrangeli*.

Cranial Characters. Skull similar to that of *S. wrangeli*, but differing as follows: nasals emarginate; interparietal much narrower antero-posteriorly and acute at both ends; brain case broader; interorbital constriction broader; zygomatic expansion slightly larger; audital bullæ much larger and more fully inflated, with corresponding reduction in breadth of basi-occipital and basi-sphenoid; mandible conspicuously larger, broader and heavier; upper and lower molars conspicuously larger; middle and last lower molars with reëntrant angle on outer side decidedly deeper than in *S. wrangeli*, and thus resembling *S. truei*; posterior loop of last upper molar as in *S. wrangeli*. (Merriam.)

Color. Above raw umber mixed with black, beneath bluish white; feet and tail dusky.

Measurements. From skeleton. Total length, 115; tail vertebræ, 22; hind foot, 19.

311. truei. (*Synaptomys*), Merr., Proc. Biol. Soc. Wash., 1896, p. 62.

Type locality. Skagit Valley, Washington.

Geogr. Distr. Northwestern Washington, limits unknown.

Genl. Char. Similar to *S. wrangeli*, but more reddish. Last lower molar with deep reëntrant angle on outer side.

Color. Above dull umber brown, grading into plumbeous of the under parts, belly hairs tipped with whitish. Tail, dark above, whitish below.

Measurements. Total length, 112; tail vertebræ, 22; hind foot, 18.

55. Lemmus.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Lemmus. Link, Zoöl. Beitr. Natur., 1795, 1, pt. 2, p. 75.

Myodes. Pall., Zoog. Ross. Asiat., 1811, 1, p. 173.

Form stout, compact; nose blunt, hairy; ears small, hidden in fur; tail short, stout, densely haired, penicillate; fore feet large, claws long, fossorial; thumb nearly obsolete with a long, flat, truncated claw; hind feet short, broad, soles hairy, tubercles naked. Skull massive, broad; rostrum short, broad; anteorbital foramen small, almost beneath anterior root of zygoma; bullæ moderate; palate terminating posteriorly in a shelf with or without azygos projection between the penultimate and last molars; ramus of mandible thin, descending process strong, twisted. Molar series long, teeth large. First upper molar with one anterior, two internal, and two external lateral triangles; middle upper molar with two transverse, one internal and one external lateral triangles. Last upper molar with four transverse triangles. First lower molar with anterior *trefoil*, one external and two internal lateral triangles, and a lateral posterior loop; middle lower molar with an internal anterior triangle, rest like first molar; last lower molar with external and one internal lateral triangles, and two posterior transverse triangles. All the external reëntrant triangles of upper series very deep as are also the internal angles of the lower series, and the respective saliencies of both acute. Upper incisors beveled laterally, tube-like; root of lower incisor stops in front of last molar.

312. trimucronatus. (*Arvicola*), Rich., App. Parry's 2d Voy., 1825, p. 309.

albogularis, Wagl., Suppl. Schreb., 1843, 111, p. 602.

alascensis, Merr., Proc. Wash. Acad. Scien., 1900, p. 26.

Type locality. Point Lake, Lat. 65°.

Geogr. Distr. Arctic regions, North America.

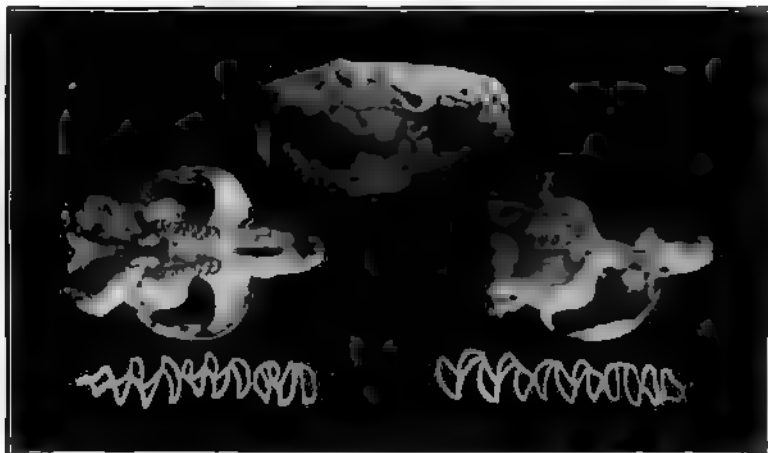


FIG. 47. LEMMUS TRIMUCRONATUS.

No. 340 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 4 times.UPPER TOOTH ROW.
Enlarged 4 times.

Genl. Char. Smaller than Hudson Bay Lemming; head flat; ears very short, hidden in fur; eyes small; upper lip deeply cleft, inside of cheeks hairy.

Color. Head and fore part of back mixed clove brown and yellowish brown, hairs tipped with blackish gray; lower back chestnut brown; sides yellowish brown; belly bluish gray mixed with yellowish brown hairs. Tail gray.

Measurements. Total length, 120-127.

a.—helvolus. (*Arvicola*), Rich., Faun. Bor. Amer., 1829, p. 128.

Type locality. Alpine Swamps 56° North latitude (Drummond, *vide* Rich).

Geogr. Distr. Arctic regions of North America.

Genl. Char. Limbs short; nose short, blunt; head oval; eyes small; ears broader than high, hairy; tail short, hairy; incisors pale yellowish.

Color. Above brownish yellow, or ruddy rust color mixed with black; sides brighter yellow; under parts and limbs pale rust yellow or tawny; margin of lips white; feet fuscous brown. Tail, above dusky, beneath whitish.

Measurements. Total length, 121; tail vertebræ, 7; hind foot, 22 (Fort Anderson).

b.—yukonensis. (*Lemmus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 27.

Type locality. Charlie Creek, Yukon River, Alaska.

Genl. Char. Size small; ears and audital bullæ large; brain case produced posteriorly.

Color. Head and anterior half of upper parts grayish brown mixed with black and yellowish fulvous; posterior half of upper parts rusty fulvous; sides and belly golden fulvous; sides of nose grayish brown; line from nose to beneath ear golden fulvous; feet dusky. Tail, dusky above, buffy below.

Measurements. Total length, 130; tail vertebræ, 17; hind foot, 19.5.

313. nigripes. (*Myodes*), True, Proc. U. S. Nat. Mus. Wash., 1894, p. 242.

Type locality. St. George Island, Pribyloff Islands, Bering Sea, Alaska.

Geogr. Distr. Known from type locality only.

Color. Above uniform cinnamon gray; cheeks, neck and sides tawny brown; beneath pale tawny; nose black; fore feet black above, tawny below; hind feet black below.

Measurements. Total length, 130; tail vertebræ, 13; hind foot, 17.5.

56. Dicrostonyx.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Dicrostonyx. Glog. Gem. Hand u. Hilfsb. d. Naturg., 1841, p. 97.

Cuniculus, Wagl. Isis, 1832, p. 1220.

Misothermus, Hensel. Zeitsch. Deutsch. Geol. Casselsch., 1855, vii, p. 492. (Part.)

Nasals short, posterior termination opposite anterior root of zygoma. Orbits with conspicuously pointed processes. Molar series divergent posteriorly. First upper molar with an anterior transverse triangle, three internal lateral angles, two external lateral angles, and a postero-external loop; middle and last upper molars with an anterior transverse loop, two external and two internal lateral triangles on middle molar, and a small postero-external loop and a trefoil on back molar. First lower molar with an anterior trefoil, three external and four internal closed triangles, and posterior loop. Other lower molars with an antero-external angle, two internal lateral, one external lateral triangle and posterior transverse loop. Incisors as in *Lemmus*. Skull similar to *Lemmus*, but less massive.

314. hudsonius. (*Mus*), Pallas, N. Sp. Quad. Glirium, 1778, p. 208.

grænländicus, (*Mus*), Traill, in Scoresby's Greenland, 1823, p. 416.

ungulatus, Baer & Helmersen, Beitr., 1841, lv, p. 283.

Type locality. Greenland.



FIG. 48. DICROSTONYX HUDSONIUS NELSONI.

No. 290 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 4 times.UPPER TOOTH ROW.
Enlarged 4 times.

Genl. Char. Ears hidden in fur, four claws on front feet, tail and legs very short.

Color. Summer Pelage. Above ash gray mixed with reddish and blackish brown; lower parts rufescent; a lateral line from sides of face and neck dividing the colors of upper and under parts, dark brown. Grayish black streak from nose to nape; sides of head gray; whiskers brown or white.

Winter Pelage. Pure white.

Measurements. Total length, 140; tail vertebrae, 13; hind foot and claw, 20; fore foot and claw, 28; longest claw, 10.

a.—unalascensis. (*Dicrostonyx*), Merr., Proc. Wash. Acad. Scien., 1900, p. 25.

Type locality. Unalaska, Alaska.

Genl. Char. Size rather large. Skull alone known. This is large and broad with subquadrate brain case, broadly spreading rounded zygomatics, broadly sulcate frontal, and prominent peg-like postorbital processes of squamosal. First upper molar with three closed interior triangles and posterior loop; and second upper molar with second interior loop normal, and separated by full interspace from anterior crescent of third upper molar, and posterior loop complete. (Merr.)

b.—nelsoni. (*Dicrostonyx*), Merr., Proc. Wash. Acad. Scien., 1900, p. 25.

alascensis, Stone, Proc. Acad. Nat. Science Phil., 1900, p. 37.

Type locality. St. Michaels to Point Barrow, Alaska.

Genl. Char. Size rather small. Audital bullae very small and narrow; incisive foramina short; molars small and narrow. Upper parts chestnut; feet white.

Color. Summer Pelage. Upper parts save rump rich chestnut, base of hairs mottled with white; rump blackish gray mottled with white; dorsal stripe blackish; face gray; ear patches chestnut. Sides and under parts tinged with rusty; breast between fore legs chestnut. Feet white. Pelage in change, central portion of upper parts mixed chestnut and yellowish white, darker posteriorly; remaining pelage yellowish white with fulvous markings, viz.: a patch on either side, one on breast, reaching to neck and ears, and ring around base of tail. Median dorsal stripe dark brown.

Winter Pelage. Pure white.

Measurements. Total length, 132-165; tail vertebræ, 21; hind foot, 18-19. Specimen from Point Barrow, Alaska.

c.—richardsoni. (*Dicrostonyx*), Merr., Proc. Wash. Acad. Scien., 1900, p. 26.

Type locality. Fort Churchill, Hudson Bay.

Genl. Char. Size large; third nail of fore foot larger than fourth; bullæ broadly rounded and somewhat depressed. Enamel pattern of molars like *D. nelsoni*.

Color. Summer Pelage. Unknown.

Winter Pelage. White.

Measurements. Total length, 143; tail vertebræ, 14; hind foot, 20.

57. Fiber.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Fiber. G. Cuvier, Leçons d'Anatomie, 1, 1800. Type *Castor zibethicus*, Linn.

Ondatra, Lacep., Less. Man., 1827, p. 286.

Size large; hind feet oblique to the leg; tail flattened sideways for nearly its entire length and fringed with stiff hairs; ears very small, deeply buried in fur; muzzle furry except nasal pads, which are naked. Palms and soles naked, fringed with hairs, 5-tubercled; dentition and skull arvicoline; squamosals much expanded; parietals reduced; interparietal nearly as long as broad, upper incisors almost a circle in shape within and without the jaw, lower incisors enter jaw to root of the condylar process; descending process of condyle hamular and much twisted. Palate terminates opposite middle of last molar and has a median azygos protuberance; pterygoid fossa wide and deep; nasals narrow posteriorly, widening rapidly anteriorly, tumid, and terminating behind the incisors; interorbital constriction excessive. Processes of squamosal and maxilla have their ends in contact; the jugal being merely a splint, not necessary for the continuity of the zygomatic arch.



FIG. 49. FIBER ZIBETHICUS.

No. 132 Field Columbian Museum Coll. Nat. size. Spec. Blindman River, N. W. T.

315. zibethicus. (*Castor*), Linn., Syst. Nat., 1, 1766, p. 79.

americana, Tiedem. Zool., 1, p. 481.

osoyoozensis, Lord, Proc. Zool. Soc., 1864, p. 95.

Type locality. Eastern Canada.

Geogr. Distr. From Labrador to the Gulf States (excepting the Dismal Swamp, Virginia, possibly) and from the Atlantic to the Pacific, north of the Gulf States and Arizona.

Genl. Char. Size large, color dark, characters those of the genus. Tail about equal to body without head.

Color. Above from very dark brown, nearly black, to pale brown; sides of head and body chestnut brown, under fur bluish gray. Feet dark brown; tail black. Specimens vary greatly in the hue of the fur.

Measurements. Total length, 538; tail vertebræ, 250; hind leg, 86.

a.—pallidus. (*Fiber*), Mearns, Bull. Am. Mus. Nat. Hist., 1890, p. 280.

Type locality. Fort Verde, Central Arizona.

Geogr. Distr. Probably from Arizona to the central plains of Montana, the lateral limits not determined.

Genl. Char. Size small, about two-thirds that of typical form. Skull like that of eastern muskrat, but smaller.

Color. Rusty brown, paler beneath; scattered hairs of tail liver brown.

Measurements. Total length, 500; tail vertebræ, 203; hind foot, 69.

b.—rivalicus. (*Fiber*), Bangs, Proc. Bost. Soc. Nat. Hist., 1895, p. 541.

Type locality. Burbridge, Louisiana.

Geogr. Distr. Lower Mississippi region and swampy coasts of Louisiana and Alabama.

Genl. Char. Smaller than *F. zibethicus*, color dull and darker.

Color. Above clove brown to black, base of hairs mouse gray; beneath vandyke or clove brown; fur on under side of legs and arms brownish white at base. A spot at middle of sides with under fur white at base. Feet and tail black.

Measurements. Total length, 530; tail vertebræ, 222; hind foot, 81.

c.—aquilonius. (*Fiber*), Bangs, Proc. N. Eng. Zool. Club, 1899, 1, p. 111.

Type locality. Rigoulette, Hamilton Inlet, Labrador.

Geogr. Distr. Labrador.

Genl. Char. Smaller than *F. zibethicus*; blacker, hind foot smaller; rostrum long, slender; nasals long, narrow.

Color. Above, long hairs tipped with black, those of rump and sides with burnt umber; beneath, throat and lower abdomen grayish; long hairs russet. Tail black; feet dusky.

Measurements. Total length, 549; tail vertebræ, 249; hind foot, 73. Skull: occipito-nasal length, 61.4; zygomatic width, 40; basal length, 58.4; mastoid width, 26.6.

316. *spatulus. Osgood, N. Am. Faun., 1900, No. 19, p. 36.*Type locality.* Lake Marsh, Northwest Territory, Canada.*Geogr. Distr.* All northwest America.*Genl. Char.* Similar to *F. zibethicus*, size small, color rather dark; skull small; molar teeth very small, nasals short and much expanded anteriorly. Skull: similar to that of *F. zibethicus*, but smaller; jugals more slender, and but slightly produced dorsally; audital bullæ smaller; molar teeth decidedly smaller; nasals much shortened and widely expanded anteriorly, rapidly becoming compressed posteriorly; angular process of mandible short, blunt and upturned; condyle narrow and somewhat rounded.*Color.* Similar to *F. zibethicus*, but apparently less suffused with fulvous.*Measurements.* Type (from dry skin). Total length, 495; tail vertebræ, 170; hind foot, 73. Skull of type: Basal length, 57; zygomatic breadth, 38; length of nasals, 21; alveolar length of molar series, 14. (Osgood, l. c.)**317. obscurus.** (*Fiber*), Bangs, Proc. Biol. Soc. Wash., 1894, p. 133.*Type locality.* Codroy, Newfoundland.*Geogr. Distr.* Newfoundland.*Genl. Char.* Smaller than *F. zibethicus*, colors darker and less ferruginous; skull small, smooth; rostrum relatively large; audital bullæ smaller; interorbital constriction broad.*Color.* Above Prout's brown shaded with vandyke brown; top of head almost black; sides dark reddish brown; beneath broccoli brown paling on sides of neck and legs to fawn; lips, and beneath nose white. Under fur slate gray. Feet blackish slate.*Measurements.* Total length, 476; tail vertebræ, 200; hind foot, 70; ear, 22.**318. macrodon.** (*Fiber*), Merr., Proc. Biol. Soc. Wash., 1897, p. 143.*Type locality.* Lake Drummond, Dismal Swamp, Virginia.*Geogr. Distr.* Only known from Dismal Swamp, Virginia.*Genl. Char.* Similar to *F. zibethicus*, but darker; incisors and molars larger. Skull: brain case elongated posteriorly; squamosal root of zygoma more sloping; teeth heavier and larger.*Color.* Upper parts abdomen and chin blackish brown; rest of pelage whitish, or pale drab tinged with fulvous.*Measurements.* Total length, 567; tail vertebræ, 244; hind foot, 80.

* The specimen, whose skull is shown in Fig. No. 49, came from Blindman River, Northwest Territory, and is apparently properly referable to *F. zibethicus*, the skin also not differing perceptibly from other examples of that species; and this would seem to indicate that if *F. spatulus* is distinct, both species are found in practically the same locality!

Fam. V. **Geomyidae.**

C. H. Merriam, *Monographic Revision of the Pocket Gophers*. N. Am. Faun., No. 8, 1895.

Large fur-lined cheek pouches present, opening outside the mouth; squamosals expanded; jugal extending to lachrymal; palate sloping below level of zygomata which are strong and flaring; molars rootless; lower jaw strong; form arvicoline; fore feet fossorial; eyes and ears minute.

58. Geomys.

$$I. \frac{1-1}{1-1}; P. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 20.$$

Geomys. Rafin., Am. Month. Mag., 11, No. 1, 1817, p. 45. Type *G. pinetis*, Raf. = *Mus tuza* Ord, 1815.

Saccophorus. Kuhl, Beitr., 1820, p. 61.

Pseudostoma. Say, Long's Exped. Rocky Mts., 1823, 1, p. 406.

Ascomys. Licht, Abhand. Berl. Acad., 1825, p. 20.

Upper incisors grooved along the middle; first and second upper molars with two enamel plates each, posterior one complete; root of inferior incisor slightly protuberant; zygomata widest anteriorly, posteriorly, but little greater than mastoid breadth; parietals ridged; audital bullæ elongate, somewhat acute anteriorly, not greatly inflated; basioccipital very broad posteriorly; pterygoid fossa wide; fore claws immensely developed. Mammæ three pair, two inguinal, one pectoral.

319. tuza. (*Mus*), Ord, Guth. Geog., 2 Amer. ed., 11, 1815, p. 292.

pinetis, Rafin, Am. Month. Mag., 1817, p. 45.

Type locality. Pine barrens near Augusta, Georgia.

Geogr. Distr. Pine barrens of Georgia and possibly northern Florida.

Genl. Char. Size rather large; tail long, naked; end of nose naked; feet haired.

Color. Above cinnamon brown tinged with fulvous; faint dark dorsal stripe; beneath ochraceous buff; hairs on feet whitish.

Measurements. Average total length of nine females, 249; tail vertebræ, 82; hind foot, 32. Ten males, total length, 269; tail vertebræ, 89.5; hind foot, 34.4. (Merr., Mon. Geom.)

a.—floridanus. (*Pseudostoma*), Aud. & Bach. N. Am. Quad., 111, 1854, p. 242.

Type locality. Vicinity of St. Augustine, Florida.

Geogr. Distr. Florida Peninsula.



FIG. 50. GEOMYS TUZA.

No 1148 Field Columbian Museum Coll. Nat. size.

Genl. Char. Similar to *G. tuza*, but darker; feet larger; ascending branches of premaxilla broader and blunter; nasals narrower posteriorly; jugal broader anteriorly; basioccipital less wedge-shaped, and audital bullæ larger.

Color. Above sooty plumbeous; sides cinnamon drab; beneath plumbeous tinged with buff; chin and throat white.

Measurements. Average total length, 288; tail vertebræ, 94; hind foot, 35.5.

b.—mobilensis. (*Geomys*), Merr., Mon. Geom. N. Am. Faun., No. 8, 1895, p. 119.

Type locality. Mobile Bay, Alabama.

Geogr. Distr. Southern Alabama and adjacent northwest Florida.

Genl. Char. Similar to *G. tuza*, smaller, darker; tail shorter. Skull long and angular; frontal broad and high; sagittal ridge present; interparietal deeply excavated posteriorly.

Color. Above sepia tinged with ochraceous on sides and lined with black; indistinct dorsal band dusky; beneath plumbeous tinged with pale fulvous. Feet whitish. White on throat and on pouches.

Measurements. Total length, 260; tail vertebræ, 82; hind foot, 33.

o.—austrianus. (*Geomys*), Bangs, Proc. Bost. Soc., 1898, p. 179, fig. 177.

Type locality. Belleair, Hillsboro County, Florida.

Geogr. Distr. Western part of Florida Peninsula.

Genl. Char. Size of *G. floridanus*; color paler, more tawny.

Color. Above pale cinnamon and tawny; lower sides ochraceous buff; beneath pale Isabella or dull white; under chin, inner sides of limbs, belly and lower sides white; feet whitish.

Measurements. Total length, 303.5; tail vertebræ, 93; hind foot, 36.8.

320. colonus. (*Geomys*), Bangs, Proc. Bost. Soc., 1898, p. 178.

Type locality. St. Mary's, Georgia.

Geogr. Distr. Limits not determined.

Genl. Char. Size of *G. tuza*, color darker; palate wide, notch round; nasals short.

Color. Above dark seal brown, washed on lower sides with russet and cinnamon; under parts cinnamon; vent fawn; feet and wrists whitish.

Measurements. Total length, 280; tail vertebræ, 100; hind foot, 36.

321. cumberlandius. (*Geomys*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 180, fig.

Type locality. Stafford Place, Cumberland Island, Georgia.

Geogr. Distr. Cumberland Island, Georgia.

Genl. Char. Size large; tail long; zygoma extends far back and joins skull without a decided angle.

Color. Above bright cinnamon; dorsal stripe russet; beneath cinnamon; hairs plumbeous at base; feet white; also white beneath chin and about wrists.

Measurements. Total length, 318; tail vertebræ, 107; hind foot, 36.

322. bursarius. (*Mus*), Shaw, Trans. Linn. Soc., 1800, v., p. 227, pl. 8.

fusca and cinerea, Rafin., Am. Month. Mag., 1817, 11, p. 45.

saccatus, Mitchell, N. Y. Med. Repos., 1821, vi, N. S., p. 249.

canadensis, Licht. Abh. Akad. Wiss., Berlin, 1825, p. 20, fig. 2.

oregonensis, LeConte, Proc. Acad. Nat. Scien. Phil., 1852, p. 160.

Type locality. Unknown. Mississippi Valley.

Geogr. Distr. Canadian border, longitude 97°, south to eastern Kansas, southeastern Missouri and southern Illinois; east nearly to Lake Michigan and west to the Dakotas and Nebraska (ninety-eighth meridian).

Genl. Char. Size large, dark; tail rather long. Anterior root of zygoma sloping back at a considerable angle. Skull long and large, angular; rostrum long and narrow.

Color. Above chestnut, beneath paler; sometimes whitish; feet white; tail brown basally, white apically.

Measurements. Average total length, 270; tail vertebræ, 80; hind foot, 35.

323. lutescens. (*Geomys*), Merr., Mon. Geom., N. Am. Faun., No. 8, 1895, p. 127.

Type locality. Sand hills of Birdwood Creek, Lincoln County, western Nebraska.

Geogr. Distr. Great Plains and southwestern South Dakota, southward to Colorado, Texas, western Nebraska, western Kansas, eastern Colorado, western Oklahoma and western Texas.

Genl. Char. Size medium, colors pale, tail moderate. Skull short, sagittal crest low; anterior root of zygoma sloping backward; brain case and rostrum short.

Color. Above in winter drab mixed with black on median line, this in summer being dull fulvous without dorsal band; beneath buffy or sometimes white.

Measurements. Average total length, 256; tail vertebræ, 77; hind foot, 32.

324. breviceps. (*Geomys*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 335.

Type locality. Prairie Mer Rouge, Morehouse Parish, Louisiana.

Geogr. Distr. Mississippi Valley and Gulf Coast, in southern Arkansas, Louisiana and Texas, and valley of the Arkansas River; north nearly to southern Kansas and west to near 98th meridian.

Genl. Char. Size small, color dark; tail medium. Skull: nasals emarginate posteriorly; ascending branches of premaxillæ broad and rounded posteriorly; interparietal small, irregular; jugal longer than basioccipital; pterygoids narrow.

Color. Above dark russet brown, darkest on median line; nose and front of face dusky tinged with russet; sides pale fulvous; beneath plumbeous washed with pale fulvous; feet and throat white; base of tail dusky.

Measurements. Average total length, 219; tail vertebræ, 64; hind foot, 27.

a.—sagittalis. (*Geomys*), Merr., Mon. Geom., N. Am. Faun., No. 8, 1895, p. 134.

Type locality. Clear Creek, Galveston Bay, Texas.

Geogr. Distr. Gulf Coast of Texas around Galveston Bay.

Genl. Char. Similar to *G. briviceps*, but smaller. Skull similar to that of *G. briviceps*, but relatively smaller in its various parts.

Color. Above russet brown tinged with fulvous; dusky on median line; nose and head almost black tinged with fulvous; interior of pouches, chin, throat and fore legs, white.

Measurements. Total length, 225; tail vertebræ, 70; hind foot, 27.

b.—attwateri. (*Geomys*), Merr., Mon. Geom., N. Am. Faun., No. 8, 1895, p. 135.

Type locality. Rockport, Arkansas County, Texas.

Geogr. Distr. Coast and islands of Texas between Matagorda and Nueces Bay; also in interior, and vicinity of San Antonio.

Genl. Char. Similar to *G. briviceps*, but larger and not so dark. Skull: zygomata strongly divergent anteriorly, angular, depressed; nasals narrow posteriorly; premaxillæ broad.

Color. Above russet brown, dusky on head and median dorsal line; beneath ranging from whitish to buffy ochraceous. Sometimes the head from nose to occiput is black.

Measurements. Total length, 250; tail vertebræ, 85; hind foot, 30.

325. texensis. (*Geomys*), Merr., Mon. Geom., N. Amer. Faun., No. 8, 1895, p. 137.

Type locality. Mason, Mason County, Texas.

Geogr. Distr. Central Texas, probably south to the Rio Grande.

Genl. Char. Size very small; tail short, apical portion naked. Skull: nasals short, broad posteriorly and sides nearly parallel and truncate posteriorly; nasal branches of premaxillæ reach or pass the plane of orbital fossa, and are pointed; jugal shorter than basioccipital; occiput bulging posteriorly.

Color. Above liver brown mixed with black. Feet and under parts white; base of hairs beneath are plumbeous in winter, white in summer; throat with a collar of buffy fulvous.

Measurements. Total length, 203; tail vertebræ, 60; hind foot, 28.

326. arenarius. (*Geomys*), Merr., Mon. Geom., N. Am. Faun., No. 8, 1895, p. 139.

Type locality. El Paso, Texas.

Geogr. Distr. Valley of upper Rio Grande from El Paso and Juarez, Chihuahua, Mexico, north to Las Cruces and west to Deming, New Mexico.

Genl. Char. Size medium, tail long, well haired, except tip, colors pale. Skull: no sagittal crest; prominent knob at distal end of squamosal arm of zygoma; interparietal truncate posteriorly on plane of lambdoid suture; occiput moderately bulging.

Measurements. Total length, 258; tail vertebræ, 88; hind foot, 33.

327. personatus. (*Geomys*), True, Proc. U. S. Mus. Wash., 1889, p. 159.

Type locality. Padre Island, Texas.

Geogr. Distr. Padre Island and mainland to Carrizo on the Rio Grande.

Genl. Char. Size large, colors pale, tail long, basal half haired. Skull: large, heavy; zygomata at right angles to the axis; jugal rounded anteriorly, shorter than basi-occipital; nasals long, narrow; superior profile nearly straight.

Color. Above pale drab; nose and above eyes dusky; beneath white. Tail, hairs white.

Measurements. Total length, 339; tail vertebræ, 103; hind foot, 37.

a.—fallax. (*Geomys*), Merr., Mon. Geom., N. Am. Faun., No. 8, 1895, p. 144.

Type locality. Nueces Bay, Texas.

Geogr. Distr. South shore of Nueces Bay and lower Nueces River, Texas.

Genl. Char. Similar to *G. personatus*, smaller, darker; tail shorter. Skull differs from that of *G. personatus* in smaller size; shorter ascending arms of premaxilla, more squarely truncate occiput and in much shorter and more swollen audital bullæ (Merr., l. c.)

Measurements. Total length, 250; tail vertebræ, 80; hind foot, 35.

59. Cratogeomys.

$$I. \frac{1-1}{1-1}; P. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 20.$$

Cratogeomys. Merr. Mon. Geom. N. Am. Faun., No. 8, 1895, p. 150. Type *Geomys merriami*. Thomas.

Upper incisor with a single groove, usually open; upper premolar with three enamel plates, posterior absent; shaft convex forward; upper and lower premolars subequal in length. First and second upper molar with one enamel plate each, posterior absent. Last upper molar with deep sulcus on outer side, none on inner. Skull: a depression extends obliquely across squamosals from root of zygoma to occiput near median line. Breadth of cranium posteriorly less than zygomatic breadth; zygomata broad and heavy.

328. castanops. (*Pseudostoma*), Baird, Rep. Stansb. Exped. to Great Salt Lake, 1852, p. 313.

clarkii, Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 332.

Type locality. Prairie Road to Bent's Fort, near the present town of Las Animas, Colorado, Arkansas River.

Geogr. Distr. From Arkansas River in Colorado on Great Plains south through eastern New Mexico and Western Texas to Santa Rosalia, Chihuahua, and Jaral, Coahuila.



FIG. 51. CRATOGEOMYS CASTANOPS.

No. 4 Field Columbian Museum Coll. Nat. size.

Genl. Char. Size medium; tail medium. Skull: broad, heavy; basioccipital rectangular, sides parallel; rostrum and brain case long; superior profile convex; end of maxillary root of zygoma greatly expanded, forming a plate.

Color. Above yellowish brown mixed with black; beneath buffy, base of hairs plumbeous, visible. Fore feet black, hind feet blackish brown. Tail hairs blackish.

Measurements. Total length, 295; tail vertebræ, 77; hind foot, 33. Another specimen from Paladura Canon, Texas, measured in total length, 280; tail vertebræ, 80; hind foot, 39. Collector's measurement.

60. *Thomomys*.

I. $\frac{1-1}{1-1}$; P. $\frac{1-1}{1-1}$; M. $\frac{3-3}{3-3} = 20$.

Thomomys. Max. Nov. Act. Akad. Cæs. Leop., 1839, p. 383. Type *T. rufescens*. Prinz Max.

Diplostoma, Rich., Faun. Bor. Amer., 1829, 1, p. 206, (nec Rafin).

Oryctomys, Ed. & Gerv. Mag. Zool., 1836, p. 23 (Part).

Upper incisors without median sulcus, but with a fine marginal groove, not, however, always present. Roots of inferior incisors forming a protuberance on outside of condylar ramus; zygomata wider posteriorly than mastoid diameter of skull. Audital bullæ inflated; basioccipital narrower in the middle than bullæ at same place. Pterygoid fossa rather short, and wide posteriorly. Upper molars with exterior edge of crown acute; lower molars with interior edge acute. Fore claws moderately developed.



FIG. 52. THOMOMYS BOTTAE.

No. 586 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 4 times.

UPPER TOOTH ROW.
Enlarged 4 times.

329. *bulbivorus*. (*Diplostoma*), Richards, Faun. Bor. Amer., 1829, 1, p. 206, pl. 18, B.

Type locality. Columbia River.

Geogr. Distr. Lower Columbia River, Oregon, to coast of California north of San Francisco.

Genl. Char. Size very large; tail short, little more than one-third head and body; claws large, strong; color dark; pterygoids concave internally, hamulars converging at the tips.

Color. Above yellowish chestnut, darkest on top of head; lips,

lower jaw, lining of pouches and anal spot white; spot on either side of mouth liver brown, beneath brownish gray.

Measurements. Total length, 357; tail vertebræ, 63.

330. nevadensis. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 213.

Type locality. Austin, Nevada.

Geogr. Distr. Nevada, limits of range unknown.

Genl. Char. Size large; two color phases, pale buff and plumbeous slate; incisors curving forward; tail more than half the length of body and head.

Color. Normal Pelage. Above buffy gray, darkest on nose and mouth; beneath whitish buff, base of fur plumbeous; feet and tail whitish, aural space dusky.

Plumbeous Pelage. Above and beneath slate color, patch on throat and inside of pouches, feet and apical portion of tail white.

Measurements. Total length, 275; tail vertebræ, 90; hind foot, 38.

331. leucodon. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 215.

Type locality. Grant Pass, Rogue River Valley, Oregon.

Geogr. Distr. Oregon, limits not determined.

Genl. Char. Similar to *T. laticeps*, smaller; incisors white; teeth small; brain case broad, temporal ridges parallel; skull similar to that of *T. laticeps*, but smaller.

Color. Above dull fulvous brown; brighter on sides and under parts; nose, sides of mouth and aural patch dusky; feet whitish; tail yellowish buff.

Measurements. Total length, 221; tail vertebræ, 68; hind foot, 29.

332. operarius. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 215.

Type locality. Keeler, Owens Lake, Inyo County, California.

Geogr. Distr. Eastern California.

Genl. Char. Size small; color pale; claws long, slender; skull short, broad; rostrum short and broad; interorbital regions broad.

Color. Above buff gray; beneath plumbeous washed with white; feet and tail white.

Measurements. Total length, 228; tail vertebræ, 67; hind foot, 30.

333. bottae. (*Oryctomys*), Eyd. & Gerv., Mag. Zool., 1836, p. 23, pl. xxi, fig. 4 (teeth).

bulbivorus, Baird (nec Richards), N. Am. Mamm., 1857, p. 389, pl. 50, fig. 1-9.

Type locality. Monterey, California.

Geogr. Distr. Central and southern California.

Genl. Char. Size medium; tail less than one-half the length of body and head; hands small, claws slender.

Color. Above chestnut brown to dark cinnamon, lined with black; beneath pale reddish brown; base of hairs lead color. Black spot behind ear; about the mouth, chin, and inner margin of pouches dusky; inside of pouches white. Feet grayish white. Tail, basal half like back on upper part, rest grayish white.

Measurements. Total length, 231; tail vertebræ, 72; hind foot, 30; ear, 9.5.

a.—pallescens. (*Thomomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1895, p. 36.

Type locality. Grapelands, San Bernardino Valley, California.

Geogr. Distr. Southern California.

Genl. Char. Size large; claws short, thick; feet medium.

Color. Above tawny brown, lightest on rump; head blackish; ear and auricular patch sooty; under parts tawny ash; feet and lower surface of limbs ash.

Measurements. Total length, 260; tail vertebræ, 89; hind foot, 35.5.

334. *laticeps.* (*Thomomys*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 335.

Type locality. Humboldt Bay, California.

Geogr. Distr. Northern California.

Genl. Char. Size small; tail nearly half as long as body and head; skull broad; rostrum short; groove on upper incisors distinct; claws on fore feet slender.

Color. Above yellow reddish brown lined with black on back; beneath tinged with reddish; throat, margin of pouches and spot behind ears dusky; chin and inside of pouches white. Tail, above dusky, beneath grayish white, feet grayish white.

Measurements. Total length, 197; tail vertebræ, 63; hind foot, 28.

335. *townsendi.* (*Geomys*), Richards, Bach. Journ. Acad. Nat. Scien. Phil., 1839, p. 105.

borealis, Bach. (nec Rich.), Journ. Acad. Nat. Scien. Phil., 1839, p. 103 (Columbia River).

Type locality. "Rocky Mountains," Wyoming.

Geogr. Distr. Southwestern Wyoming.

Genl. Char. Colors pale, size medium; tail over one-third the length of head and body.

Color. Above pale yellowish brown, beneath white; a small patch on breast white to roots, otherwise the bases are plumbeous. Inside of pouches whitish.

Measurements. Total length, 148; tail vertebræ, 42; hind foot, 24.

336. monticola. (*Thomomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1893, p. 48, pl. 1, figs. 3, 4.

Type locality. Mt. Talac, Eldorado County, California.

Geogr. Distr. Northern California from San Francisco Bay to northwestern Nevada.

Genl. Char. Skull long and narrow; outer face of upper incisors with a ridge on inner edge; claws long and slender; tail one-third the length of head and body.

Color. Above pale reddish brown tinged with gray; beneath ashy white tinged with buff; around ears black. Feet and tail whitish.

Measurements. Total length, 210; tail vertebræ, 55; hind foot, 28; fore foot 20.

a.—pinetorum. (*Thomomys*), Merr., N. Am. Faun., No. 16, 1899, p. 97.

Type locality. Sisson, Siskiyou County, California.

Geogr. Distr. Northern California, limits of range unknown.

Genl. Char. "Similar to *T. monticola*, but smaller; skull shorter and broader; colors paler."

Color. "Above pale fulvous; nose dusky; sides of head plumbeous or washed with buffy, or ochraceous."

Measurements. "Total length, 210; tail vertebræ, 76; hind foot, 28." (Merr., l. c.)

337. mazama. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 214.

Type locality. Crater Lake, Mt. Mazama, Oregon.

Geogr. Distr. Mt. Mazama, Oregon, range unknown.

Genl. Char. Size small; color similar to *T. monticola*, but darker.

Color. Above fulvous brown; beneath washed with fulvous; nose, orbital and aural space dusky; feet and tail whitish.

Measurements. Total length, 214; tail vertebræ, 71; hind foot, 27.5.

338. quadratus. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 214.

Type locality. The Dalles, Oregon.

Geogr. Distr. Oregon, Plains of the Columbia?

Genl. Char. Similar to *T. mazama* in color; skull short and broad; zygoma with anterior external angle nearly square; jugals parallel; nasals short, broad, truncate posteriorly; upper incisors not sloping forward.

Color. Above russet fulvous; beneath plumbeous washed with salmon fulvous; nose and aural spot dusky; feet and tail whitish.

Measurements. Total length, 220; tail vertebræ, 67; hind foot, 29.

339. nasicus. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 216.

Type locality. Farewell Bend, Des Chutes River, Oregon.

Geogr. Distr. Oregon.

Genl. Char. Similar to *T. mazama*, paler; skull long, slender; nasals long; zygomata sloping backward; audital bullæ very small; interparietal large, transversely lengthened.

Color. Above pale russet fulvous; beneath plumbeous washed with pale fulvous; usual aural spot; feet and tail whitish.

Measurements. Total length, 214; tail vertebræ, 69; hind foot, 27.

340. douglasi. (*Geomys*), Rich. Faun. Bor. Amer., 1829, 1, p. 200.

Type locality. Vicinity of Portland, Oregon.

Geogr. Distr. Lower Columbia River, northward into British Columbia.

Genl. Char. Tail about one-third length of body and head, claws large, stout.

Color. Above reddish or chestnut brown; slightly mottled on sides and under parts with ashy brown; throat, about cheek pouches and between fore legs grayish ash; dusky spot behind ear; edge of lips and top of nose also dusky; feet grayish white; tail dusky above, grayish white below.

Measurements. Total length, 205; tail vertebræ, 50; hind foot, 25.

a.—fuscus. (*Thomomys*), Merr., N. Am. Faun., No. 5, p. 69.

Type locality. Head of Big Lost River, Idaho.

Geogr. Distr. Mountains of Central Idaho.

Genl. Char. Tail nearly half as long as body and head; colors dark; size large.

Color. Above chestnut; beneath plumbeous washed with fulvous; black around ear; tail and feet whitish.

Measurements. Total length, 215; tail vertebræ, 72; hind foot, 27; ear, 3.

b.—yelmensis. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1899, p. 21.

Type locality. Tenino, Yelm Prairie, southwestern Washington.

Geogr. Distr. Washington, range not determined.

Genl. Char. Similar to *T. douglasi*, paler; skull has larger interparietals; frontals depressed interorbitally; angle of mandible forming a hook; incisors broader, thicker.

Color. "Similar to *T. douglasi*, but very much paler; face with the dark markings of the mountain species."

Measurements. Total length, 222; tail vertebræ, 68; hind foot, 32.

341. talpoides. (*Cricetus*), Rich. Zool. Journ., 111, 1828, p. 518.

borealis, Rich. (nec Bach.) Rep. Brit. Ass. for 1836, vi, 1837, p. 150.

Type locality. Hudson Bay.

Geogr. Distr. Saskatchewan region south to Upper Missouri region.

Genl. Char. Size rather large; color dark; tail less than half the length of body and head; mammæ six pairs, two each, inguinal, pectoral and axillary.

Color. Above grayish black, sometimes tinged with reddish; chin, throat, patches on breast, feet and tail white; beneath plumbeous.

Measurements. Total length, 227; tail vertebræ, 50; hind foot, 32.

a.—rufescens. (*Thomomys*), Wied. Nov. Acta. Acad. Cæs. Leop., 1839, xix, p. 383.

Type locality. "Missouri."

Geogr. Distr. Upper Missouri and valley of the Saskatchewan.

Genl. Char. Cheek pouches small, furred. Tail nearly half the length of body; feet broad, claws stout.

Color. Upper parts and sides grayish yellow brown, darkest on dorsal line. Under parts, fore legs, hind feet, tail and inside of cheek pouches yellowish white; Dusky spot behind ear.

Measurements. Total length, 168; tail vertebræ, 54; hind foot, 29.

342. melanops. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1869, p. 21.

Type locality. Solduck Trail, Olympic Mountains, Washington.

Geogr. Distr. Olympic Mountains, Washington. High elevation.

Genl. Char. Size small; similar to *T. mazama*.

Color. Above chestnut; nose space around eye and ear patch, slate black; beneath plumbeous washed with fulvous; feet white; tail hairs few and wide apart; above like the back; beneath whitish; tip blackish.

Measurements. Total length, 206; tail vertebræ, 63; hind foot, 27.

343. fulvus. (*Geomys*), Woodh. Proc. Acad. Nat. Scien. Phil., 1852, p. 201.

umbrinus, Baird, N. Am. Mamm., 1857, p. 399.

Type locality. San Francisco Mountains, New Mexico.

Geogr. Distr. New Mexico and Arizona to central California.

Genl. Char. Size medium; tail half as long as body and head; claws large, long.

Color. Above reddish brown, darkest on dorsal region; sides and under parts yellowish white, tinged with rufous on abdomen; lips and ears dusky; inside of pouches whitish; tail with basal part like back.

Measurements. Total length, 239; tail vertebræ, 79; hind foot, 29; ear, 8.

a.—nigricans. (*Thomomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1895, p. 36.

Type locality. Grapelands, San Bernardino Valley, California.

Geogr. Distr. Southern California.

Genl. Char. Size large; claws short, thick; skull massive, angular; dentition weak; interparietal longer than wide.

Color. Above tawny brown, rump lighter; head blackish; ears and aural patch sooty; beneath tawny ash; feet and lower surface of limbs ash.

Measurements. Total length, 260; tail vertebræ, 89; hind foot, 33.5. Skull: total length, 39; zygomatic breadth, 24.4; basilar length, 35.5; nasals, 11.9; interorbital constriction, 6.9; length of mandible, 25.

b.—intermedius. (*Thomomys*), Mearns, Proc. U. S. Nat. Mus. Wash., 1897, xix, p. 719.

Type locality. Huachuca Mountains, Arizona.

Geogr. Distr. Mountains connecting Colorado Plateau with that of Mexico.

Genl. Char. Smaller than *T. fulvus*.

Color. General hue Mars brown, dorsal area plumbeous black; feet and tail soiled white. Base of under fur plumbeous.

Measurements. Total length, 220; tail vertebræ, 66; hind foot, 24.

344. angularis. (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 214.

Type locality. Los Baños, Merced County, California.

Geogr. Distr. Western California.

Genl. Char. Size medium; skull similar to that of *T. fulvus*, but more massive; zygomata larger and more spreading; pterygoids larger; larger angular processes of mandible; incisors more prominent.

Color. Above fulvous mixed with black, most numerous on median line; nose and ears blackish; beneath plumbeous washed with buffy ochraceous; feet and tail whitish.

Measurements. Total length, 257; tail vertebræ, 75; hind foot, 32.

- 345. alpinus.** (*Thomomys*), Merr., Proc. Biol. Soc. Wash., 1897, p. 216.

Type locality. Mt. Whitney, California.

Geogr. Distr. High Sierra, eastern California.

Genl. Char. Size small; dark; similar to *T. fulvus*, but paler; skull small; zygomata spreading; nasal short; brain case rounded; temporal ridges not strongly pronounced.

Color. Above drab brown suffused with pale fulvous brown; nose and mouth dusky; beneath plumbeous washed with ochraceous buff; feet and tail whitish.

Measurements. Total length, 228; tail vertebræ, 67; hind foot, 30.

- 346. clusius.** (*Thomomys*), Coues, Proc. Acad. Nat. Scien. Phil., 1875, p. 138.

Type locality. Bridger's Pass, Rocky Mountains.

Geogr. Distr. Uncompahgre Reservation, Utah, through southwestern Wyoming into southern and central Idaho.

Genl. Char. Smallest species known; tail less than one-third the length of head and body; colors pale, mammæ six pairs; claws weak.

Color. Above pale yellowish gray tinged with pale brown; fur plumbeous at base; beneath white to the roots. Feet and tail white, snout blackish.

Measurements. Total length, 127; tail vertebræ, 38; hind foot, 18.

- 347. aureus.** (*Thomomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1893, p. 49, pl. 1, figs. 6, 7.

Type locality. Bluff City, Utah.

Geogr. Distr. San Juan region, southeastern Utah.

Genl. Char. Size large; claws developed, large; skull similar to that of *T. perpallidus*, but broader and heavier.

Color. Post Breeding Pelage. Above golden, interspersed with dusky tipped hairs on back and crown; beneath white to roots of hairs; around ear blackish; feet white. Tail, basal half yellowish, apical half whitish.

Breeding Pelage. Above dull dusky yellowish; beneath grayish white, base of hairs plumbeous.

Measurements. Total length, 296; tail vertebræ, 66; hind foot, 35.

- 348. perpallidus.** (*Thomomys*), Merr., Scien., 1886, viii, p. 588.

Type locality. Colorado Desert, southern California.

Geogr. Distr. Colorado Desert, southern California and north-eastward to the Painted Desert, Arizona.

Genl. Char. Similar to *T. clusius*, tail longer, half the length of head and body. Color pale.

Color. Above pale brownish yellow, sides yellowish white, beneath white; feet white. Tail, white for two-thirds the length, tip blackish.

Measurements. Total length, 228; tail vertebræ, 76; hind foot, 52.

349. cervinus. (*Thomomys*), Allen, Bull. Amer. Mus. Nat. Hist., 1895, p. 203, fig. 1.

Type locality. Phoenix, Arizona.

Geogr. Distr. Southern Arizona.

Genl. Char. Size large; color pale; rostrum broad, heavy; skull large.

Color. Above fawn, obscured on dorsal region with dusky; beneath gray, base of hair plumbeous; blackish area about ears; pouches inside white; feet whitish; tail above grayish fawn, paler beneath.

Measurements. Total length, 228; tail vertebræ, 63; hind foot, 28.

350. altivalis. (*Thomomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1895, p. 34.

Type locality. San Bernardino Mountains, California.

Geogr. Distr. Mountains of southeastern California.

Genl. Char. Size medium, larger than *M. monticola*. Skull long and narrow; rostrum long and wide, nasals long; incisors wide and strong, molars massive; coronoid process of mandible erect, acutely pointed.

Color. Above dull chestnut brown, darker on dorsal region, median line nearly black; aural patch large, dusky reaching nearly to occiput; beneath plumbeous gray, washed with rusty; feet and legs like under parts; tail grayish.

Measurements. Total length, 228; tail vertebræ, 74; hind foot, 29. Skull: total length, 39.7; basilar length, 34; zygomatic width, 23.2; interorbital constriction, 7, nasals, 13.

351. fossor. (*Thomomys*), Allen, Bull. Am. Mus. Nat. Hist. 1893, p. 51.

Type locality. Florida, LaPlata County, Colorado.

Geogr. Distr. Upper San Juan region, Colorado.

Genl. Char. "Size large; claws large; interparietal convex anteriorly; nasals terminating posteriorly on a line with the maxillaries."

Color. Above dusky brown tinged with gray; dorsal region washed with dark chocolate brown; sides grayer; beneath grayish plumbeous, hairs tipped with pale buff, sometimes with whitish; chin and center of throat white; aural area black; feet whitish; tail basal two-thirds blackish, rest white.

Measurements. Total length, 293; tail vertebræ, 64; hind foot, 30.

Fam. VI. **Heteromyidae.**

Incisors narrow, molars rootless; mastoids enormously developed, appearing on top of the skull; hind feet long, digits four or five; pelage soft.

Sub. Fam. I. **Dipodomyinae.**

Skull two-thirds as wide as long; occipital plane emarginate; zygomatic plate of maxillary nearly roofing the orbit; anterior molar without lobe to the prism; pit on inner side of jaws near molars.

61. Dipodomys.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Dipodomys. Gray, Ann. & Mag. Nat. Hist. 1841, p. 521. (Type *D. philipsi*.)

Macrocolus, Wagn. Archiv. fur Naturg., 1846, 1, p. 172.

Dipodops, Merr., N. Am. Faun., 1890, No. 4, p. 43. Type *D. ordi*.

Skull, light, depressed, smooth, thin, broad posteriorly, tapering anteriorly; anterior outline emarginate; rostrum extending beyond incisors, acuminate; zygomata delicate, straight, abutting against tympanics, which are greatly inflated and possess a nontubular orifice of meatus; mastoids enormous; squamosals reduced; parietal triangle-shaped, interparietal small, situated between forks of occipital; bullæ in contact below the basi-sphenoid; palate terminates posteriorly with a sharp median somewhat lengthened spur; external to this is a fossa with two small anterior foramina, and a large one behind pterygoids with a hamular termination abutting the bullæ; basioccipital narrow, acuminate, reduced; separated by a fissure for its entire length from the bullæ; a similar fissure divides the last named bones from the alisphenoid and squamosal. The interorbital foramen, or what passes for one, is placed low down midway on the side of the rostrum; incisive foramina minute slits between incisors and molars. In the rear of the skull the occipital bones appear as a rim to the foramen magnum. Upper incisors sulcate, pointing backwards; molars rootless. Mandible small, thick, with a conspicuous acute lamina twisting obliquely outward and upward. Mental foramen outside, near incisors. Hind legs elongated, tail longer than head and body, penicillate; soles hairy. Hind foot with four toes only. Cheek pouches large; fur of velvet softness. All the species of both genera have facial crescentic lines more or less distinctly marked,

and side of mouth white; a white spot over the eyes and another behind the ear, and a white stripe across the thighs usually reaching the tail.



FIG. 53. *DIPODOMYS MERRIAMI*.

No. 580 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 8 times.

UPPER TOOTH ROW.
Enlarged 8 times.

352. merriami. (*Dipodomys*), Mearns, Bull. Amer. Mus. Nat. Hist., 1890, p. 290.

Type locality. New River, Arizona.

Geogr. Distr. Arizona.

Genl. Char. Limbs and tail slender, latter longer than head and body; skull small.

Color. Above mouse gray tinged with pinkish buff; sides sandy; nose and sides of face black nearly to eyes; aural spot and under parts white. Tail drab gray, white band on either side, not reaching extremity.

Measurements. Total length, 281; tail vertebrae, 149; hind foot, 36.

a.-nevadensis. (*Dipodomys*), Merr., Proc. Biol. Soc. Wash., 1894, p. 111.

Type locality. Pyramid Lake, Nevada.

Geogr. Distr. Northwestern Nevada.

Genl. Char. Similar to *D. merriami*, tail shorter, hind foot longer; color paler.

Color. Above pinkish buff, lined on head and back with black; black marks on face distinct; stripes on thigh and under parts white; stripes on tail above and below meeting at end of tail dusky. Legs, inside dusky to the heel.

Measurements. Total length, 240; tail vertebræ, 140; hind foot, 39; ear, 13.

b.—*nitratus*. (*Dipodomys*), Merr., Proc. Biol. Soc. Wash., 1894, p. 112.

Type locality. Keeler, Owens Lake, California.

Geogr. Distr. Eastern California.

Genl. Char. Small; hind feet larger than those of *D. merriami*, no fascial crescents; no black markings.

Color. Above ochraceous without black markings; white spot over eye; beneath white; upper and lower stripes on tail same color as back; stripes on side continuous.

Measurements. Total length, 239; tail vertebræ, 141; hind foot, 37.8.

c.—*nitratoides*. (*Dipodomys*), Merr., Proc. Biol. Soc. Wash., 1894, p. 112.

Type locality. Tipton, San Joaquin Valley, California.

Geogr. Distr. South central California.

Genl. Char. Similar to *D. nitratus*, but fascial crescents present.

Color. Above fulvous; facial marks dusky; inside of hind legs to heel fulvous; beneath and stripe on thigh white; dorsal tail stripe darker than back, ventral stripe fulvous and extending length of tail; crested portion of tail like back.

Measurements. Total length, 246; tail vertebræ, 148; hind foot, 35.

d.—*exilis*. (*Dipodomys*), Merr., Proc. Biol. Soc. Wash., 1894, p. 113.

Type locality. Fresno, San Joaquin Valley, California.

Geogr. Distr. South central California.

Genl. Char. Smaller than *D. merriami* and darker.

Color. Above clay color heavily lined with black; darkest on top of head; sides tinged with ochraceous buff; black lines on face across the nose; superciliary stripe whitish; lower part of legs and ankles black; beneath white; tail stripes sooty black, meeting about one-third the length from tip, rest of tail white.

Measurements. Total length, 227; tail vertebræ, 135.5; hind foot, 34.

e.—ambiguus. (*Dipodomys*), Merr., N. Am. Faun., No. 4, 1890, p. 42.

Type locality. El Paso, Texas.

Geogr. Distr. Northwestern Texas.

Genl. Char. Tail one-third longer than head and body; size medium; body slender.

Color. Above buffy drab; sides tinged with pale buff and lined everywhere with black; beneath white. Upper and lower tail stripes dusky to tip; lateral stripe white, terminating with the vertebræ.

Measurements. Total length, 233; tail vertebræ, 133; hind foot, 37; ear, 7.

f.—parvus. (*Dipodomys*), Rhoads, Amer. Nat., 1894, p. 70.

Type locality. San Bernardino, California.

Geogr. Distr. San Bernardino Valley, southern California.

Genl. Char. Similar to *D. merriami*, smaller, tail longer and without black markings on face and nose.

Color. Above buffy gray, sides buff; under parts white; usual white eye and ear spot, and stripe on thighs; dark dorsal and ventral tail stripes brownish black, pencil sooty black; lateral stripes white; orbital ring black; under surface of hind foot brownish.

Measurements. Total length, 248; tail vertebræ, 154; hind foot, 35; ear, 10.

g.—similis. (*Dipodomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1893, p. 411.

Type locality. White Water, San Diego County, California.

Geogr. Distr. Southeastern California.

Genl. Char. Similar to *D. m. simiolus*, darker; legs and tail relatively shorter. Skull with smaller mastoids, and wider across ante-orbital processes of maxillary than in *D. m. simiolus*, and the lower premolar wider than long.

Color. Above light tawny lined sparingly with blackish, darkest on rump; beneath white. Dorsal and ventral tail stripes blackish to tip; lateral stripes white.

Measurements. Total length, 241; tail vertebræ, 143; pencil, 25; hind foot, 38; ear above crown, 10.5. Skull: basilar length, 22; mastoid breadth, 24.5. interorbital constriction, 14; nasals, 14; coronoid process from angle, 5.

h.—simiolus. (*Dipodomys*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1893, p. 410.

Type locality. Agua Caliente, California.

Geogr. Distr. Coast region of California, north of San Francisco.

Genl. Char. Similar to *D. deserti*, but smaller; pencil not white.

Color. Above like *D. deserti*, inclining to cinnamon on rump; beneath white. Tail, upper fourth dark ashy extending to tip; brownish black on middle third of under side. Feet white, soles slightly darker.

Measurements. Total length, 241; tail vertebræ, 149; hind foot, 38; ear from crown, 9; pencil, 35. Skull: basilar length, 21.8; mastoid breadth, 24; interorbital constriction, 14.5; nasals, 13; mandible to base of incisors, 13.8; coronoid process from angle, 5.6.

353. deserti. (*Dipodomys*), Steph., Am. Nat., 1887, p. 42, pl. v.

Type locality. Mojave River, near San Bernardino Mountains, California.

Geogr. Distr. Mojave and Colorado Deserts, southeastern California.

Genl. Char. Large; colors pale; tail longer than head and body; mastoids greatly developed.

Color. Above pale yellowish brown, hairs plumbeous at base; legs, feet and under parts white; tail white with a pale brown dorsal stripe from near base to white tip, growing darker towards end. White spot over eye and behind ear. White thigh stripe.

Measurements. Total length, 133; tail vertebræ, 204; hind foot, 32.

354. spectabilis. (*Dipodomys*), Merr., N. Am. Faun., No. 4, 1893.

Type locality. Das Cabejos, Cochize County, Arizona.

Geogr. Distr. Portions of Texas and Arizona eastward to Sierra Blanca, Texas.

Genl. Char. Size large; tail nearly twice the length of head and body; mastoids meet behind parietals; maxillary bridge of orbit broad.

Color. Above ochraceous buff lined with black, sides paler; top of head and back darkest; fascial crescent crossing nose black; hip patch ochraceous; hind leg, white above, dusky below. Dorsal stripe of tail dusky for basal half followed by a broad black band, terminating in a long white brush; ventral stripe dusky, the two meeting about two-thirds the length of tail from base, the lateral white stripes disappearing.

Measurements. Total length, 355; tail vertebræ, 211; pencil, 30; hind foot, 56; ear, 17.5.

355. elator. (*Dipodomys*), Merr., Proc. Biol. Soc. Wash., 1894, p. 109.

Type locality. Henrietta, Clay County, Texas.

Geogr. Distr. Northern Texas, limits of range unknown.

Genl. Char. Similar to *D. spectabilis*, but smaller; tail more slender, hind feet longer; supraoccipital between bullæ very broad; interparietal broad as long.

Color. Above clay color lined with blackish; flanks light ochraceous buff; black line above lips broad; thigh patches large; under parts white. Tail white with an upper and under stripe extending nearly to the pencil, and dorsal stripe blackish on crested part, paler for the basal two-thirds of its length, the ventral stripe pale; the white on sides of tail reaching nearly to the tip. Inner sides of legs dusky.

Measurements. Total length, 292; tail vertebræ, 173; hind foot, 47; ear, 14.

356. californicus. (*Dipodomys*), Merr., N. Am. Faun., No. 4, 1890, p. 49.

Type locality. Ukiah, Mendocino County, California.

Geogr. Distr. Northwestern California.

Genl. Char. Size large; color very dark; skull on superior outline arched, interparietal not twice as long as broad.

Color. Above sepia tinged with pale ochraceous; sides paler; beneath white. Thigh patches grading into dusky on back of leg. Dark tail stripes black, meeting in front of white pencil.

Measurements. Total length, 302; tail vertebræ, 183; hind foot, 43; pencil, 16; ear, 9.

62. Perodipus.

$$I. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 16.$$

Perodipus. Fitzinger. Sitz. d. K. Akad. d. Wissensch. l. Abth., 1867, p. 70.

Skull similar to that of *Dipodomys*, with greatly developed mastoids and thread-like zygomata; audital bullæ in contact below basisphenoid. Hind feet with five claws, the first digit rudimentary, but having a claw and reaching to the end of the metatarsal bones of the other digits.

357. agilis. (*Dipodomys*), Gambel, Proc. Acad. Nat. Scien. Phil., 1848, p. 77.

hermanni & *wagneri*, Le Conte, Proc. Acad. Nat. Scien. Phil., 1848, p. 79.

Type locality. California.

Geogr. Distr. Middle and southern California.

Genl. Char. Size small, color dark; body rather stout.

Color. Above ashy brown heavily lined with black, especially on top and sides of head and lower back; sides yellowish brown, spot over eye and behind ear, side of snout, stripe on thighs and under parts white. Fascial crescent, black and broad, and meeting on



FIG. 54. PERODIPUS AGILIS.

No. 6554 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 7 times.UPPER TOOTH ROW.
Enlarged 7 times.

bridge of nose. Tail blackish, and with a blackish tip; lateral white stripes terminate at base of pencil. Under part of leg and base of foot dusky, rest white.

Measurements. Total length, 280; tail vertebræ, 170; hind leg, 39.5; ear, 14.5.

358. streatori. (*Perodipus*), Merr., Proc. Biol. Soc. Wash., 1894, p. 113.

Type locality. Carbondale, Mariposa County, California.

Geogr. Distr. West foot of Sierra Nevada, California.

Genl. Char. Similar to *P. agilis*, but larger; tip of tail normally white.

Color. Above Isabella brown, darker on dorsal region and sides of neck, sides suffused with ochraceous buff; the usual fascial crescent, and eye and ear spot; beneath white. Dark tail, stripes dusky, meeting and forming a broad subapical band; tip normally white.

Measurements. Total length, 292; tail vertebræ, 179; hind foot, 43.

359. chapmani. (*Dipodomys*), Mearns, Bull. Am. Mus. Nat. Hist., 1890, p. 291.

Type locality. Fort Verde, Arizona.

Geogr. Distr. Elevated Central Tract, Arizona.

Genl. Char. More slender than *P. ordi*; tail longer and color darker. Skull lighter, smaller.

Color. Above mouse gray mixed with black and buff; sides sandy buff; usual white line on side of nose, white ear and eye spots, and thigh stripe; under parts white. Dorsal and ventral stripes drab gray; lateral white stripes extending to near end of vertebræ.

Measurements. Total length, 280; tail vertebræ, 148; hind foot, 38.

360. ordi. (*Dipodomys*), Woodh. Proc. Acad. Nat. Scien. Phil., 1853, p. 235.

Type locality. El Paso, Rio Grande, Texas.

Geogr. Distr. From Snake Plains and their northward extensions south to New Mexico and Arizona.

Genl. Char. Size medium; tail little shorter than head and body.

Color. Above ochraceous buff, darkest on back mixed with black on rump; sides paler; side of nose, spot behind the ear, stripe across thigh and under parts white. Tail with dorsal and ventral stripes dusky, base of hairs white.

Measurements. Total length, 240; tail vertebræ, 134; hind foot, 38; ear 7.

a.—columbianus. (*Perodipus*), Merr., Proc. Biol. Soc. Wash., 1894, p. 115.

Type locality. Umatilla, Oregon.

Geogr. Distr. Plains of the Columbia, Oregon.

Genl. Char. Similar to *P. ordi*, but paler; ears blackish.

Color. Above clay color mixed with blackish; thigh patches and inner side of leg tinged with ochraceous; interior and upper border of ear blackish; beneath white; dusky stripes on upper and under side of tail; lateral white stripes nearly meeting towards end of tail, tip dusky.

Measurements. Total length, 244.5; tail vertebræ, 140.5; hind foot, 39.

361. richardsoni. (*Dipodops*), Allen, Amer. Mus. Nat. Hist., 1891, p. 277.

Type locality. Beaver River, Indian Territory.

Geogr. Distr. Oklahoma and Indian Territories.

Genl. Char. Similar to *P. ordi*, but larger. Skull: rostrum robust; intermastoid area quadrate, lateral borders slightly concave, anterior border longer than posterior.

Color. Above ochraceous buff, lined with black; sides paler; legs outside to heels like sides of body; beneath white, as is also the

thigh stripe. Dorsal and ventral tail stripes plumbeous black to tip; lateral white stripes extending beyond the vertebræ. Inside of ear ochraceous, mixed with black; outside whitish.

Measurements. Total length, 289; tail vertebræ, 144.8; hind foot, 40.6; ear from crown, 10.7. Skull: total length, 40.6; basal length, 28.2; mastoid breadth, 25.9; intermastoid area length, 5.1; anterior border, 3.6; posterior, 3; nasals, 14.7.

362. sennetti. (*Dipodops*), Allen, Bull. Amer. Mus. Nat. Hist., 1891, p. 226.

Type locality. Brownsville, Cameron County, Texas.

Geogr. Distr. Southeastern Texas.

Genl. Char. Similar to *P. ordi*, but darker. Skull: rostrum broad, elongated; mastoid separated by rather broad interparietal, quadrate in shape and with lateral margins inclining inwards; anterior and posterior width about equal. Orbital bridge of maxillary broad.

Color. Above yellowish ochraceous buff, mixed with black, darkest on dorsal region; sides lighter; flanks buffy yellow; beneath white. Upper tail stripe dusky brown, lower paler, both reaching end of tail; lateral white stripes continued beyond end of vertebræ.

Measurements. Total length, 210; tail vertebræ, 110; hind foot, 35; ear, 9.

363. panamintinus. (*Dipodops*), Merr., Proc. Biol. Soc. Wash., 1894, p. 114.

Type locality. Panamint Mountains, California.

Geogr. Distr. Panamint Range, eastern California.

Genl. Char. Largest of genus.

Color. Above buffy clay, tinged with ochraceous; thigh patches like back; inside of legs dusky; beneath white; dark stripes on tail light dusky; lateral white stripes meeting on distal third; ear posteriorly whitish.

Measurements. Total length, 301; tail vertebræ, 183; hind foot, 44; ear from base, 15.

364. longipes. (*Dipodops*), Merr., N. Am. Faun., No. 3, 1890, p. 72.

Type locality. Echo Cliffs, Painted Desert, Arizona.

Geogr. Distr. Utah, Wyoming, Nebraska, New Mexico, and Arizona.

Genl. Char. Similar to *P. ordi*, hind feet longer, tail longer, color pale. Skull: zygomatic breadth of the maxillary rounded below; parietals without a long, slender postero-lateral process.

Color. Above ochraceous buff finely lined with black; eye and ear spot white; beneath pure white. Tail, upper and under stripes grayish dusky; the latter narrow, both continuing to the end of pen-

cil, the base of hairs of which are white; lateral white stripes broad reaching basal part of pencil. Legs, above white, beneath dusky.

Measurements. Total length, 275; tail vertebræ, 165; pencil, 25; hind foot, 42; ear from crown, 8.

365. compactus. (*Dipodomys*), True, Proc. U. S. Nat. Mus. Wash., 1888, p. 160.

Type locality. Padre Island, Texas.

Geogr. Distr. Known from type locality only.

Genl. Char. Size medium; hind foot shorter than skull; tail equal in length to the head and body; color pale.

Color. Above pale pinkish buff tinged on head and back with sepia; beneath white; thigh stripe white. Sides and distal half of under side of tail white; upper surface, including the pencil, and proximal half of under surface sepia.

Measurements. Total length, 215; tail vertebræ, 114; hind foot, 31.

63. Microdipodops.

Microdipodops. Merr., N. Am. Faun., 1891, Pt. 5, p. 115.

Cranium similar to that of *Dipodomys*, but with the tympano-mastoid much more inflated. Palatal shelf extending posteriorly to foramen ovale with a deep fossa on each side. Zygomatic process of maxillary not expanded in front of orbit; mandible without post-molar pit, and the angular process truncated. Mastoids meet along median line and project posteriorly, their breadth being greater than basilar length. Molars rootless; upper premolar with anterior prism.



FIG 55. MICRODIPODOPS MEGACEPHALUS.

No. 43193 Field Columbian Museum Coll. Nat. size.

LOWER TOOTH ROW.
Enlarged 10 times.

UPPER TOOTH ROW.
Enlarged 10 times.

366. megacephalus. (*Microdipodops*), Merr., N. Am. Faun., 1891, Pt. 5, p. 116.

Type locality. Halleck, Nevada.

Geogr. Distr. Central Nevada.

Genl. Char. Size small; tail not crested at tip, slightly exceeding the length of head and body. Hind feet long, furred; ears covered with fur. Other characters those of the genus.

Color. Above yellowish brown, mixed with black and tinged with olive; sides from nose and thigh pale ochraceous. Beneath white, fur plumbeous at base, except on throat and breast, which are white to the roots of hairs. Feet buffy white. Tail, basal two-thirds like back, rest blackish; under sides pale buffy ochraceous. The usual black crescent on face at base of whiskers and buff patch behind the ears.

Measurements. Total length, 150; tail vertebræ, 80; hind foot, 24; ear from crown, 6.

Sub. Fam. II. **Heteromyinae.**

C. H. Merriam. *Revision of the North American Pocket Mice.* N. Am. Faun., No. 1, 1889, p. 1.

W. H. Osgood. *Revision of the Pocket Mice of the genus Perognathus.* N. Am. Faun., No. 18, 1900.

64. Perognathus.

$$I. \frac{1-1}{1-1}; P. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 20.$$

Perognathus. Wied., Nov. Act. Acad. Cæs. Leop. Carol., 1839, xix, p. 369. Type *P. fasciatus*, Wied.

? *Cricetodipus*. Peale, Rep. Mamm. & Ornith. U. S. Expl. Exped., 1848, p. 53, pl. 13, fig. 2. Type *P?* *parvus*, Peale.

Abromys. Gray, Proc. Zool. Soc., 1868, p. 202. Type *P. lordi*, Gray.

Octognosis. Coues., Proc. Acad. Nat. Scien. Phil., 1875, p. 305. Type *P. flavus*, Baird.

Chaetodipus. Merr., N. Am. Faun., No. 1, 1889, p. 5. Type *P. hispidus?* Baird.

Skull depressed and flat above, nasals lengthened, projecting beyond incisors; mastoids less developed than those of the species of *Dipidomyinae*, and in certain species do not project beyond plane of occiput; zygomata much as in ordinary rodents. Occiput not emarginate; molars rooted; no pit between last lower molar and coronoid process; tail moderate; soles naked or sparsely haired.

A. Perognathus.

Mastoid well developed, extending beyond occipital line; interparietal pentagonal; mastoid side of parietal longest; audital bullæ nearly contiguous below basisphenoid.



FIG. 56. PEROGNATHUS FLAVUS.

No. 592 Field Columbian Museum Coll. Enlarged $\frac{1}{2}$.UPPER TOOTH ROW.
Enlarged 10 times.LOWER TOOTH ROW.
Enlarged 10 times.

367. fasciatus. (*Perognathus*), Wied., Nov. Act. Akad. Cæs. Leop. Carol., 1839, p. 369, pl. 34.

Type locality. Near junction of Yellowstone and Missouri Rivers, Montana.

Geogr. Distr. Eastern Montana and Wyoming and western North and South Dakota.

Genl. Char. Small; tail nearly as long as head and body; ears small, no antitragal lobe; posterior half of soles haired.

Color. Above blending of olive green and olive gray tinged with pale fulvous and lined with black; lateral stripe pale fulvous; feet and under parts white; two light yellow patches on ears, and one larger behind ears. Tail, slightly paler beneath than above and buffy on sides.

Measurements. Total length, 135; tail vertebræ, 60; hind foot, 17.5; ear, 4.5.

a.—infraluteus. (*Perognathus*), Thomas, Ann. & Mag. Nat. Hist., 1893, p. 405.

Type locality. Loveland, Larimer County, Colorado.

Geogr. Distr. Colorado; limits of range not known. *Type locality* only.

Genl. Char. Size smaller than *P. fasciatus*; pelage soft. Soles hairy on posterior half.

Color. Above grayish olivaceous; sides, limbs and under parts

except throat and center of neck and breast, which are white), fulvous; base of fulvous hair slaty gray; tail above yellowish, beneath white.

Measurements. Total length, 117; tail vertebræ, 57; hind foot,

Skull: basilar length, 17.3; greatest medium length, 21.2; masseteric breadth, 11; nasal length, 7.7; interorbital breadth, 4.9.

8. *flavescens*. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 11.

copci, Rhoads, Proc. Acad. Nat. Scien. Phil., 1893, p. 404.

Type locality. Kennedy, Nebraska.

Geogr. Distr. South Dakota, Nebraska, Kansas, extending possibly to Texas, west to Rocky Mountains.

Genl. Char. Similar in size to *P. fasciatus*; colors quite different.

Skull smaller, cranium less arched, interparietal broader; auditory bullæ meeting below basisphenoid.

Color. Above pale yellowish brown lined with blackish; lateral stripe pale fulvous; beneath white to roots of hairs. Around eyes pale fulvous. Tail above pale grayish, beneath white.

Measurements. Total length, 136; tail vertebræ, 63; hind foot, 4; ear, 4.

9. *merriami*. (*Perognathus*), Allen, Bull. Amer. Mus. Nat. Hist., 1892, p. 45, pl. 111, fig. 1-6.

flavus, Baird, N. Amer. Mamm., 1857, p. 423. (Part.) Thomas, Proc. Zool. Soc., 1888, p. 449.

mcarnsi, Allen, Bull. Am. Mus. Nat. Hist., 1896, p. 237.

Type locality. Brownsville, Texas.

Geogr. Distr. From Washburn, Texas, to Roswell, New Mexico; east to San Antonio, west to Comstock on the Rio Grande.

Genl. Char. Size smaller than *P. flavescens*; color bright, sides golden; tail about equal to head and body.

Color. Autumn Pelage. Above yellow heavily lined with black; sides golden sparsely mixed with black; beneath white; thighs golden, rest white; subauricular spot pure white; tail pale brownish yellow above, becoming blackish at tip; beneath paler.

Measurements. Total length, 118; tail vertebræ, 55; hind foot, 16; ear, 4.

α.—*gilvus*. Osgood, N. Am. Faun., No. 18, p. 22.

Type locality. Eddy, New Mexico.

Geogr. Distr. Western Texas and southeastern New Mexico.

Genl. Char. Similar to *P. merriami*, paler.

Color. "Paler and more yellowish than *merriami*; back and sides well mixed with black; lateral line wide; postauricular spots rather prominent; tail whitish below, slightly dusky above."

Measurements. Total length, 118; tail vertebræ, 58; hind foot, 16.5.

370. flavus. (*Perognathus*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 332.

Type locality. El Paso, Texas.

Geogr. Distr. Northeastern Colorado and western Nebraska to Mexico, westward to central Arizona, east to western Texas.

Genl. Char. Size very small; ear without antitragal lobe; tail less than head and body, audital bullæ meeting below basisphenoid.

Color. Above pale fulvous lined with black, no lateral stripe; feet and under parts white; buff patch behind ear and white one on lower margin; orbital ring pale fulvous; tail pale brownish or olive gray, of nearly same hue above and below.

Measurements. Total length, 117; tail vertebræ, 71; hind foot, 17; ear, 4.

a.—bimaculatus. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 12.

Type locality. Fort Whipple, Yavapai County, Arizona.

Geogr. Distr. Southeastern Utah to central and northeastern Arizona.

Genl. Char. Small; tail shorter than head and body; ear large, no antitragal lobe. Skull: mastoids large; lower premolar smaller than last molar.

Color. Above mixed buff and black, the latter predominating; lateral stripe buff; large postauricular buff spot; feet and under parts white; tail pale brown on proximal two-thirds; distal third blackish.

Measurements. Total length, 121; tail vertebræ, 61; hind foot, 17.5; ear, 5.

b.—fuliginosus. (*Perognathus*), Merr., N. Am. Faun., No. 3, 1890, p. 74.

Type locality. Northeast of San Francisco Mountain, Arizona. Altitude 7,000 feet.

Geogr. Distr. Lava beds near San Francisco Mountain, northern Arizona.

Genl. Char. Colors dark, under parts fulvous.

Color. Above sooty brown tinged with yellowish brown; spots behind eyes and ears yellowish; lateral stripe fulvous; under parts fulvous; throat and breast white.

Measurements. Total length, 116; tail vertebræ, 58; hind foot 18; ear, 4.

371. apache. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 14. *flavus*, Merr., N. Am. Faun., No. 3, 1890, p. 73.

Type locality. Keam Cañon, Apache County, Arizona.

Geogr. Distr. Eastern Arizona, western New Mexico and southern Utah.

Genl. Char. Size large; tail as long as head and body; no anti-tragal lobe; soles haired.

Color. Above tawny ochraceous, sparingly lined with black; fore legs, feet and under parts white. Tail yellowish above, whitish beneath; white spot on lower margin of ear.

Measurements. Total length, 150; tail vertebræ, 79; hind foot, 20; ear, 7.

372. callistus. (*Perognathus*), Osgood, N. Am. Faun., No. 18, 1900, p. 28.

Type locality. Kinney Ranch, Green River basin, near Sweetwater County, Wyoming.

Geogr. Distr. Only known from type locality.

Genl. Char. Smaller than *P. apache*; color different.

Color. Above grayish olive buff and black; lateral line pale buff; under parts white; ears whitish exteriorly; tail above dusky, beneath white.

Measurements. Total length, 135; tail vertebræ, 63; hind foot, 18.

373. panamintinus. (*Perognathus*), Merr., Proc. Acad. Nat. Scien. Phil., 1894, p. 265, fig. 4.

Type locality. Perognathus Flat, Panamint Mountains, California.

Geogr. Distr. Panamint Mountains, eastern border of California, through southern Nevada to St. George, Utah.

Genl. Char. Small; tail longer than head and body; color dark; skull long and slender.

Color. Above ochraceous, sometimes grayish buff, lined with black; feet and under parts white; tail dusky above, ochraceous beneath.

Measurements. Total length, 152; tail vertebræ, 78; hind foot, 19.8.

a.—bangsi. (*Perognathus*), Mearns, Bull. Am. Mus. Nat. Hist., 1898, p. 300.

Type locality. Palm Spring, Colorado Desert, southern California.

Geogr. Distr. Desert valleys of southern and southeastern California.

Genl. Char. Smaller than *P. panamintinus*, and paler.

Color. Above pale vinaceous buff faintly lined with black; feet, fore legs, and lower parts white. Tail, above dusky, pencil pale brown, beneath white; ears with white spot at base, and one above.

Measurements. Total length, 138; tail vertebræ, 80; hind foot, 19. Skull: greatest length, 21; greatest breadth, 12.

b.—arenicola. (*Perognathus*), Stephens, Proc. Biol. Soc. Wash., 1900, p. 153.

Type locality. San Felipe Narrows, San Diego County, California.

Genl. Char. Similar to *P. panamintinus bangsi*, but paler and whiter; mastoids greatly swollen and projecting much farther back than the occiput; interparietal very small.

Measurements. Total length, 141; tail vertebræ, 82; hind foot, 19. (Stephens, l. c.)

c.—brevinasus. (*Perognathus*), Osgood, N. Am. Faun., No. 18, 1900, p. 30.

Type locality. San Bernardino, California.

Geogr. Distr. Southwestern California.

Genl. Char. Similar to *P. panamintinus*, but darker. Skull smaller; interparietal smaller, nasals shorter; lower premolar larger than last molar.

Color. Above pinkish buff lined with black; lateral line pinkish buff; ears dusky, orbital ring buffy. Tail, buffy white, faintly dusky above.

Measurements. Total length, 124; tail vertebræ, 66; hind foot, 17.4. (Osgood, l. c.)

374. nevadensis. (*Perognathus*), Merr., Proc. Acad. Nat. Scien. Phil., 1894, p. 264, fig. 3.

Type locality. Halleck, East Humboldt Valley, Nevada.

Geogr. Distr. Central Nevada to southern Oregon and northern Utah.

Genl. Char. Small; similar to *P. panamintinus*, color of sides and belly alike.

Color. Above buffy gray mixed with black; lateral stripe buffy ochraceous spreading over belly. Tail, dark above, buffy ochraceous below. Throat and pectoral region white.

Measurements. Total length, 127; tail vertebræ, 72.4; hind foot, 18.7.

375. pacificus. (*Perognathus*), Mearns, Bull. Amer. Mus. Nat. Hist. N. Y., 1898, p. 299.

Type locality. Mouth of Tijuana River, Mexican boundary, San Diego, California.

Geogr. Distr. Edge of Pacific Ocean, on a flat at mouth of Tijuana River.

Genl. Char. Similar to *P. brevinasus*, but smaller, tail more

hairy, lower premolar quadrate, mastoids moderate; interparietal wider than long; lower premolar larger than last molar.

Color. Above pale ochraceous drab lined with black. Spot at base of whiskers and ears blackish. Orbital area pale buff. Spot behind eye and lateral line on body pale buff. Feet and under parts white. Tail, hoary at base, tip dusky.

Measurements. Total length, 109; tail vertebræ, 53; hind foot, 15.5; ear from crown, 4.7.

376. *amplus*. (*Perognathus*), Osgood, N. Am. Faun., No. 18, 1900, p. 32.

Type locality. Fort Verde, Arizona.

Geogr. Distr. Known from type locality only.

Genl. Char. Size large; tail long, hairy; hind sole naked to posterior fifth which is hairy; antitragus not lobed; mastoids large.

Color. Above pinkish buff lined with black; buff lateral line; under parts white; fore legs buff nearly to wrist. Tail buff, mixed above with black.

Measurements. Total length, 155; tail vertebræ, 80; hind foot, 20. (Osgood, l. c.)

377. *longimembris*. (*Octognosis*), Coues, Proc. Acad. Nat. Scien. Phil., 1875, p. 305.

parvus. Coues (nec. Peale), Proc. Acad. Nat. Scien. Phil., 1875, p. 303. True, Proc. U. S. Nat. Mus., 1882, p. 474.

inornatus. Merr., N. Am. Faun., No. 1, 1889, p. 15.

Type locality. Fort Tejon, Kern County, California.

Geogr. Distr. San Joaquin Valley, southern California.

Genl. Char. Large; ears without antitragal lobe; tail longer than head and body; posterior third of soles haired.

Color. Above yellowish brown lined with dusky; lateral line yellowish brown; fore legs, feet and under parts white. Tail yellowish, dusky at tip; yellow patch behind ear; ears, buff outside, dusky inside, white spot at base.

Measurements. Total length, 149; tail vertebræ, 78; hind foot, 19; ear, 4.5.

378. **parvus*. (*Cricetodipus*), Peale, U. S. Expl. Exped., 1848, p. 53, pl. 13, fig. 2. juv.

* The type of this species appears to be lost, and whether it was a Pocket mouse or a Kangaroo rat is not likely ever to be definitely determined. Peale's description points to both genera; all the characters and the color indicate, unmistakingly, a Kangaroo rat; but the measurements being of such exceedingly small dimensions apparently point to the Pocket mice. Its identity being therefore impossible to determine at present, it does not seem judicious to assert that Peale's *Cricetodipus parvus* is the same as *Perognathus monticola*, Baird, a well-known species, and reduce the latter to a synonym, as Mr. Osgood has done in his revision of *Perognathus*, page 34, for the two forms agree neither in color nor measurements, but better to let Peale's species stand by itself until happily the time may arrive when its proper status can be satisfactorily ascertained.

parvus. (*Perognathus*), Baird, N. Am. Mamm., 1857, p. 425.

Type locality. Oregon.

Genl. Char. "Head ovate, the snout elongate, pointed and covered with hair excepting the nostrils, which are small and convolute; lips large, tumid and covered with short hairs; whiskers numerous, white; a tuft of white hairs or bristles on the chin; cheek pouches spacious, opening outside of the mouth and reaching from the upper lip to the throat; the cavity extending backward from the ears and lined with hair; eyes medium size; ears small, round, and fringed with hairs; fore legs small, the feet moderate and margined with bristly hairs; the nails short, curved, excepting that of the thumb, which is orbicular or resembling the human thumb nail; hind legs long, the feet large and strong, five-toed, the middle one slightly longer than the rest; inner toe shortest, reaching only to the end of the metatarsal bones of the others; all the nails short, pointed and slightly curved; tail long, tapering, and clothed with silky hairs."

Color. "Above sepia brown, beneath white, a dark line across the cheeks beneath the eyes."

Measurements. "Length of head and body 1 9-10 inch; head from nose to occiput, 9-10 inch; ears, 3-20 inch; tail, 2 3-10 inches; fore leg from the elbow, 9-20 inch; fore foot, 3-10 inch; tibia, 7-10 inch; hind foot, 3-10 inch; metatarsus, 5-10 inch." (Peale.)

Peale says of this specimen: "The formation of its hind legs leaves but little room to doubt that its habits are similar to the jumping mice *Meriones labradorius* (Richardson), which are inhabitants of the same region. Its SINGULARLY LARGE HEAD WHICH EXCEEDS ITS BODY IN BULK, its ample cheek pouches, *long hind legs*, and long tail present a general form which is peculiar and altogether very remarkable. * * * * The specimen is a female, and presents the rudiments of a fourth molar tooth in each side of the lower jaw, which would eventually have replaced the front ones, already much worn."

379. monticola. (*Perognathus*), Baird, Mamm. N. Amer., 1857, p. 422, pl. 51.

parvus, Osgood, N. Amer. Faun., No. 18, 1900, p. 34 (nec Peale).

Type locality. St. Mary's Mission, Montana, west of Rocky Mountains? (Baird). The Dalles, Oregon? (Osgood).

Geogr. Distr. Valley of the Yakima River, Washington, and thence southeast to central and southeastern Oregon.

Genl. Char. Tail longer than head and body, antitragus lobed; bullæ meeting below basisphenoid.

Color. Above mixed cinnamon and dusky; beneath white; hairs plumbeous at base; lateral stripe pale cinnamon; outside of fore leg dusky; feet whitish; tail above like back, beneath like belly.

Measurements. Head and body, 76; tail, 78, tip gone; hind foot, 21. (Baird.)

a.—mollipilosus. (*Perognathus*), Coues, Proc. Acad. Nat. Scien. Phil., 1875, p. 296.

monticola, Coues, (nec Baird), Proc. Acad. Nat. Scien. Phil., 1875, p. 296. Townsend, Proc. U. S. Nat. Mus., 1888, p. 177.

Type locality. Fort Crook, Shasta County, California.

Geogr. Distr. Northeastern California to Klamath Basin, Oregon.

Genl. Char. Size small, tail longer than head and body; anti-tragus lobed; soles naked.

Color. Above yellowish cinnamon lined with blackish; beneath white; lateral stripe pale fulvous; tail above like back; beneath white.

Measurements. Head and body, 64; tail vertebræ, 82; hind foot, 20.5. (From Coues).

b.—olivaceus. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 15.

amænus, Merr., N. Am. Faun., No. 1, 1889, p. 16.

Type locality. Kelton, Utah.

Geogr. Distr. Northern Utah and southern Idaho to Owens Valley, California; west to southern Oregon and northeastern California.

Genl. Char. Size large; ears with antitragal lobe as high as broad, large; tail longer than head and body; bullæ not meeting below basisphenoid.

Color. Above yellowish brown lined with black and tinged with olive; beneath white; tail above, proximal half like back, distal half sooty brown; beneath white; white spot on ear margin.

Measurements. Total length, 184; tail vertebræ, 101; hind foot, 23; ear, 5.

c.—magrudensis. (*Perognathus*), Osgood, N. Am. Faun., No. 18, 1900, p. 38.

Type locality. Mount Magruder, Nevada, 8,000 feet altitude.

Geogr. Distr. Southern Nevada and adjacent parts of California.

Genl. Char. Similar to *P. m. olivaceus*, but larger.

Color. "Same as *P. m. olivaceus*."

Measurements. Total length, 198; tail vertebræ, 107; hind foot, 26.

380. *alticola.* (*Perognathus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1893, p. 412.

Type locality. Squirrel Inn, San Bernardino Mountains, California.

Geogr. Distr. Southeastern California. Known from type locality only.

Genl. Char. Small; tail about equal in length to head and body; ears white.

Color. Above yellowish brown lined with blackish; base of hairs plumbeous; lateral stripe tawny. Legs, feet and under parts white; tail above, proximal half tawny, distal half blackish; beneath white. Ears white within and without.

Measurements. Total length, 157; tail vertebræ, 77; hind foot, 20; ear, 5.

381. lordi. (*Abromys*), Gray, Proc. Zool. Soc., 1868, p. 202.

Type locality. "British Columbia."

Geogr. Distr. Southern British Columbia to plains of the Columbia River, Washington.

Genl. Char. Tail longer than head and body; antitragus present, but no anterior projecting lobule.

Color. Above slaty buff strongly mixed with black; beneath buff, large pectoral and inguinal patch white. White spot at base of ear. Fore feet buff, hind feet white. Tail, basal half dusky mixed with buff, apical half and tip black; beneath pale gray.

Measurements. Head and body, 175; tail vertebræ, 91; hind foot, 23; ear, 6.5.

α.—columbianus. (*Perognathus*), Merr., Proc. Acad. Nat. Scien. Phil., 1894, p. 263, fig. 2.

Type locality. Pasco, Plains of the Columbia, Washington.

Geogr. Distr. Southern Washington.

Genl. Char. Large; colors pale; tail longer than head and body.

Color. Above smoky gray mixed with blackish, tinged with olivaceous; faint lateral stripe; tail above, pale on proximal half, darker apically.

Measurements. Total length, 187; tail vertebræ, 96; hind foot, 23; ear from anterior base, 9.

382. formosus. (*Perognathus*), Merr., N. Am. Faun., No. 11, 1889, p. 17.

Type locality. St. George, Utah.

Geogr. Distr. Southwestern Utah, southern Nevada and adjacent portion of California.

Genl. Char. Large; ears large with antitragal lobe; tail crested longer than head and body; soles naked.

Color. Above grizzled yellowish brown mixed with black; below white; tail, proximal third above like back, remainder graduated sooty brown; beneath yellowish white.

Measurements. Total length, 195; tail vertebræ, 111; hind foot, 26; ear, 6.

A. Chaetodipus.

"Mastoids moderately developed, not projecting behind plane of occiput; interparietal broadly pentagonal, or strap-shaped; mastoid side of parietal not longest; audital bullæ separated anteriorly by full width or nearly full width of basisphenoid."



FIG. 57. PEROGNATHUS (CHAETODIPUS) FEMORALIS.

No. 5065 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 8 times.

LOWER TOOTH ROW.
Enlarged 8 times.

383. baileyi. (*Perognathus*), Merr., Proc. Acad. Nat. Scien. Phil., 1894, p. 262, fig. 1.

Type locality. Magdalena, Sonora, Mexico.

Geogr. Distr. Seventy miles southwest of Tucson, Arizona, into Sonora, Mexico and northern Lower California.

Genl. Char. Large; tail very much longer than head and body; mastoids considerably developed; bullæ nearly meeting below basisphenoid; interparietal pentagonal, broadest anteriorly.

Color. Above drab brown lined with black; beneath white; pale lateral stripe; tail above dusky; beneath white.

Measurements. Total length, 210; tail vertebræ, 122; hind foot, 27.

384. hispidus. (*Perognathus*), Baird, Mamm. N. Am., 1857, p. 421.

fasciatus, Baird, N. Am. Mamm., 1857, p. 420.

hispidus, Baird, N. Am. Mamm., 1857, p. 421.

spilotus, Merr., N. Am. Faun., No. 1, 1889, p. 25.

Type locality. Charco Escondido, Mexico.

Geogr. Distr. Southern and western Texas, north to Oklahoma, south to Mexico.

Genl. Char. Tail slightly shorter than head and body; hind foot broad and short; ears moderate; antitragus lobed; pelage harsh, no bristles.

Color. Above brownish black and cinnamon; lateral stripe bright fulvous, almost orange; under parts, fore legs and feet white. Tail black above, beneath whitish, without crest or tuft.

Measurements. Total length, 208; tail vertebræ, 102; hind foot, 24.

*n.—*paradoxus.* (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 24, pl. 111, fig. 18.

latirostris, Rhoads, Am. Nat., 1894, xxviii, p. 185.

conditi, Allen, Bull. Am. Mus. Nat. Hist., N. Y., 1894, p. 318.

Type locality. Trego County, Kansas.

Geogr. Distr. From the Dakotas to Texas, west to base of Rocky Mountains.

Genl. Char. Large; ears large with antitragal lobe; soles naked.

Color. Above yellowish brown lined with black; sides fulvous; fore legs fulvous outside; feet and under parts white; tail above fuliginous, beneath white tinged with fulvous.

Measurements. Total length, 205–242; (Merr., measurements, l. c. 100 mm., error;) tail vertebræ, 103–119; hind foot, 26; ears, 5.

385. penicillatus. (*Perognathus*), Woodh. Proc. Acad. Phil., 1852, p. 200.

Type locality. San Francisco Mountain, Arizona? Little Colorado Desert?

Geogr. Distr. Bunkerville, Nevada, to Yuma, Arizona.

Genl. Char. Size large; tail much longer than head and body, crested; ear large, high antitragal lobe; soles naked. Cranial characters those of the subgenus.

Color. Above gray suffused with yellowish brown and lined with black; fore legs, feet and under parts white; lateral stripe indistinct pale fulvous; tail above dusky extending over pencil, beneath white.

Measurements. Total length, 210; tail vertebræ, 122; hind foot, 23. Taken by collector in flesh. Carriso Creek, California.

a.—angustirostris. (*Perognathus*), Osgood, N. Am. Faun., No. 18, 1900, p. 47.

Type locality. Carriso Creek Desert. Colorado, California.

Geogr. Distr. "Colorado Desert, south to northern Lower California and east to the Colorado River and southwestern Arizona."

*Specimens from Oklahoma Territory are much darker above, and the lateral stripe much brighter and deeper than in the typical species, and are intermediate between *P. h. paradoxus* and *P. hispidus*.

Genl. Char. "Similar to *P. penicillatus*, but smaller; color about the same; skull lighter and with longer and more slender rostrum."

Color. "As in *P. penicillatus*."

Measurements. "Total length, 191; tail vertebræ, 105; hind foot, 24.4. (Dry skin)." (Osgood, l. c.)

b.—pricei. (*Perognathus*), Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 318.

obscurus, Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 216.

Type locality. Oposura, Sonora, Mexico.

Geogr. Distr. South central Arizona into northwestern Mexico, west of the Sierra Madre.

Genl. Char. Smaller than *P. penicillatus*, but similar; no spines on rump.

Color. Above vinaceous buff lined with black; sides the same; lateral stripe hardly perceptible; under parts white; ears like back; tail dusky above, white below.

Measurements. Total length, 172; tail vertebræ, 90; pencil, 10; hind foot, 23; ear, 7.5.

386. eremicus. (*Perognathus*), Mearns, Bull. Am. Mus. Nat. Hist., 1898, p. 300.

Type locality. Fort Hancock, El Paso County, Texas.

Geogr. Distr. Western Texas, south into central Mexico.

Genl. Char. Small; color pale; skull rather heavy.

Color. Above whitish drab tinged with fawn and lined with dusky; lateral stripe faint; feet and lower parts white; tail above and tip pale brown; beneath white.

Measurements. Total length, 163; tail vertebræ, 83; hind foot, 22.1; ear from base, 9.1.

387. stephensi. (*Perognathus*), Merr., Proc. Acad. Nat. Scien. Phil., 1894, p. 267, fig. 7.

Type locality. Northwest Arm of Death Valley (Mesquite Valley), California.

Geogr. Distr. Only known from type locality.

Genl. Char. Small; ears medium, tragus higher than broad.

Color. Above buffy drab to pale brown; fore legs, feet and under parts white; tail above, including pencil, slightly darker than back, beneath white.

Measurements. Total length, 177; tail vertebræ, 96; hind foot, 21.

388. intermedius. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 18, pl. 11, fig. 13.

obscurus, Merr., N. Am. Faun., No. 1, 1889, p. 20.

Type locality. Mud Spring, Mojave County, Arizona.

Geogr. Distr. Arizona and New Mexico into Mexico. Exact range unknown.

Genl. Char. Size medium; tail much longer than head and body; antitragal lobe large; soles naked.

Color. Above drab gray tinged with pale fulvous and lined with black; lateral line pale fulvous; fore legs, feet and under parts white. Tail above sooty brown, beneath whitish.

Measurements. Total length, 183; tail vertebræ, 106; pencil, 18; hind foot, 21; ear, 4.5.

389. fallax. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1899, p. 19, pl. 111, fig. 14.

Type locality. Reche Cañon, southeast of Colton, San Bernardino County, California.

Geogr. Distr. Southwestern California, into lower California, west of the San Bernardino and San Jacinto ranges.

Genl. Char. Medium; tail crested, longer than head and body; antitragal lobe higher than broad; soles naked. Bristles on rump.

Color. Above dark grizzled yellowish brown lined with black; lateral line pale fulvous, covering upper surface of fore leg; under parts white. Tail above sooty brown, beneath white.

Measurements. Total length, 177; tail vertebræ, 96; hind foot, 24; ear, 6.

390. femoralis. (*Perognathus*), Allen, Bull. Am. Mus. Nat. Hist., 1891, p. 281.

Type locality. Dulzura, San Diego County, California.

Geogr. Distr. San Diego County, southern California, into lower California.

Genl. Char. Tail much longer than head and body; size large.

Color. Above grayish yellowish brown lined with black; lateral line fulvous; fore legs, feet and under parts white; tail above rusty brown, including tip, beneath white.

Measurements. Total length, 198-241; tail vertebræ, 112-133; hind foot, 25-27.

391. californicus. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 26.

armatus, Merr., N. Am. Faun., No. 1, 1889, p. 27.

Type locality. Berkeley, California.

Geogr. Distr. Coast region of California from San Francisco Bay to Bear Valley, San Benito Valley, San Benito County.

Genl. Char. Smaller than *P. femoralis*; ears large, antitragal

lobes high; tail longer than head and body, crested; soles naked; skull long, narrow; mastoids small.

Color. Above grizzled yellowish brown lined with black; lateral stripe pale fulvous; beneath white. Tail above sooty black, beneath white.

Measurements. Total length, 195; tail vertebræ, 101; hind foot, 24; ear, 6.5.

a.—dispar. (*Perognathus*), Osgood, N. Am. Faun., No. 18, 1900, p. 58.

Type locality. Carpentaria, Santa Barbara County, California.

Geogr. Distr. "Coast Valleys of California from San Bernardino to San Benito County, and north along the foothills of the west slope of the Sierras to Placer County."

Genl. Char. Larger than *P. californicus*, and paler.

Color. Above bister; lateral line pinkish or ochraceous buff; under parts buffy white. Tail bicolor.

Measurements. Total length, 218; tail vertebræ, 120; hind foot, 27.

392. spinatus. (*Perognathus*), Merr., N. Am. Faun., No. 1, 1889, p. 21.

Type locality. "Twenty-five miles below The Needles, Colorado River, California."

Geogr. Distr. Desert region of southern California, south into lower California.

Genl. Char. Size medium; tail longer than head and body, crested, tufted; antitragal lobe large; soles naked; rump spinous.

Color. Above drab gray lined with black; lateral stripe wanting; fore legs, feet and under parts white. Tail above dusky, below white; pencil dusky.

Measurements. Total length, 179; tail vertebræ, 104; pencil, 15; hind foot, 21; ear from crown, 3.5.

65. Heteromys.

$$I. \frac{1-1}{1-1}; P. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 20.$$

Heteromys. Desm., Mamm., 1822, p. 313.

Molars rooted; flattened spines mingled with the fur. Skull almost flat above, slightly arched in middle of superior outline, nasals projecting beyond incisors; mastoids level with plane of occiput; zygomata depressed, but do not dip to level of palate; occiput horizontal, flat; tail long, exceeding body and head; soles hairy with five tubercles.



FIG. 58. HETEROMYS ALLENI.

No. 3268 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 7 times.LOWER TOOTH ROW.
Enlarged 7 times.

393. *alleni*. (*Heteromys*), Coues, Bull. Mus. Comp. Zool., 1881, viii, p. 187.

Type locality. Hacienda Angostura, Rio Verde, Mexico.

Geogr. Distr. Southern Mexico, northward to the mouth of the Rio Grande in Texas.

Genl. Char. Soles hairy, five tuberculated; tail long; pelage coarse, with flattened spines intermixed in the hairs. Incisors yellow.

Color. Above blackish; the hairs having buff bases and tips black, the lighter color showing amid the darker one. Lateral line from nose to thighs bright buff; under parts white. Upper parts of fore legs and thighs like back; feet white. Ears like back, lips white. Tail bicolor, above black, beneath white.

Measurements. Total length, 238-260; tail 115-136; hind foot, 28-30.

Fam. VII. **Zapodidae.**

E. A. Preble. *Revision of the Jumping Mice of the genus Zapus.*

N. Am. Faun., No. 15, 1899.

"Super incisors compressed, sulcate; premolar small; molars rooted, cervical vertebræ unanchylosed. Cranial portion of the skull shorter and broader than in *Muridae*. Auditory bullæ transverse without special development. Anteorbital foramen large, rounded, with a supplementary nick, or additional foramen at its lower portion. Malar mounting the zygomatic process of maxillary to effect suture with the lachrymal. Zygomatic arch styloid, much depressed. Trunk enlarged posteriorly in correlation with the shortness of the fore limbs, and great elongation of the hind ones, espe-

cially of the pes; nevertheless the pes with five perfect and separate metatarsals and five functionally developed digits, claws not peculiar. Tail greatly exceeding the trunk in length, very slender, scant haired." (Coues.)

Sub. Fam. I. **Zapodinae.**

66. Zapus.

$$I. \frac{1-1}{1-1}; P. \frac{1-1}{0-0}; M. \frac{3-3}{3-3} = 18.$$

Zapus. Coues, Bull. U. S. Geol. Surv. Terr., 1, 2d ser., No. 5, p. 253, 1875. Type, *D. hudsonius*. Zimm.

Napeozapus. Preble, N. Am. Faun., No. 15, 1899, p. 33. Type, *Z. insignis*, Miller.

Eozapus. Preble, N. Am. Faun., No. 15, 1899, p. 37. Type, *Z. setchuanus*, Pousargues.

Internal cheek pouches; first digit of hand rudimentary, nail flat, blunt; palms and soles naked, granulate, tuberculate, save heel which is smooth; meatus large, antitragus much developed. Pelage coarse. Skull delicate, papery construction; anteorbital foramen very large and obliquely oval; malar extended until sutured with the lachrymal; zygomatic arch slender, depressed; bullæ short, placed transversely; rostrum attenuate anteriorly; interorbital constriction moderate; no post-orbital process; interparietal large, nearly square; mastoids moderate; pterygoid fossa wide; pterygoid long, straight, ending close to bullæ; palate with posterior rounded arch ending opposite last molars, and broadest anteriorly. Descending process of mandible twisted diagonally outward and upward; coronoid falcate, acute, higher than condyle. Upper incisors, sulcate, short, stout; upper premolar absent in one sub-genus.

A. Zapus.

"Premolar present; enamel folds closely crowded; tail not tipped with white; ears rather long; lower parts white or ochraceous."

394. hudsonius. (*Dipus*), Zimm., Geog. Gesch. Mens. u. vierfuss, Thiere., 1780, 11, p. 358.

labradorius, Kerr., Anim. King., 1792, p. 276.

canadensis, Davies, Trans. Linn. Soc. Lond., 1798, lv, p. 167.

americanus, Wagl., Nat. Syst. Amph., 1830, p. 23.

microcephalus, Harlan, Proc. Zool. Soc. Lond., 1839, p. 1.

acadicus, Dawson, Edinb. New Phil. Journ., N. S., 1856, 111, p. 2.

hardyi, Batchelder, Proc. N. Eng. Zool. Club, 1899, 1, p. 5.

Type locality. Hudson Bay.



FIG. 59. ZAPUS HUDSONIUS.

No. 10902 Field Columbian Museum Coll. Enlarged $\frac{1}{2}$.UPPER TOOTH ROW.
Enlarged 8 times.LOWER TOOTH ROW.
Enlarged 8 times.

Geogr. Distr. Hudson Bay south to New Jersey, mountains of North Carolina west to Iowa and Missouri and northwest to Alaska.

Genl. Char. Medium size; molars and incisive foramina small.

Color. Summer Pelage. Above ochraceous lined with black; dorsal stripe darker; beneath white; tail grayish brown above, whitish beneath; feet white.

Fall Pelage. Sides duller, more yellow, dorsal area indistinct.

Measurements. Total length, 209; tail vertebræ, 124; hind foot, 20.5.

a.—ladas. (*Zapus*), Bangs, Proc. New. Eng. Zool. Club, 1, 1899, p. 10.

Type locality. Regoulette, Hamilton Inlet, Labrador.

Geogr. Distr. Eastern Quebec, north to Hamilton Inlet, Labrador.

Genl. Char. Larger than *Z. hudsonius*, hind foot and tail longer; color darker; skull and zygomata longer, brain case higher and longer; rostrum longer; bullæ longer.

Color. Summer Pelage. Dorsal area mixed with ochraceous; less conspicuous; sides ochraceous buff; beneath white tinged with buff; tail dusky above, whitish beneath. Feet white.

Fall Pelage. Above yellowish, dorsal area very indistinct.

Measurements. Total length, 238; tail vertebræ, 153; hind foot, 32.

b.—alascensis. (*Zapus*), Merr. Proc. Biol. Soc. Wash., 1897, p. 223.

Type locality. Yakutat, Alaska.

Geogr. Distr. Yakutat Bay north to Yukon River; limits unknown.

Genl. Char. Larger and darker than typical *Z. hudsonius*.

Color. Dorsal area distinct, dark mixed with brownish; sides dark ochraceous mixed with black; beneath white; tail bicolor.

Measurements. Total length, 218; tail vertebræ, 132; hind foot, 31.5.

c.—americanus. (*Dipus*), Barton, Am. Phil. Soc., 1799, lv, p. 115.

Type locality. Philadelphia, Pa.

Geogr. Distr. From Raleigh, North Carolina, north to southern Connecticut and valley of lower Hudson.

Genl. Char. Similar to and smaller than *Z. hudsonius*; dorsal area less distinct.

Color. Summer Pelage. Above deep ochraceous; dorsal area indistinct mixed with black; ear nearly black; sides of head paler, feet and under parts white tinged with ochraceous.

Fall Pelage. Dorsal area mixed with yellowish; sides dull yellowish.

Measurements. Total length, 191.3; tail vertebræ, 115.4; hind foot, 28.3.

d.—campestris. (*Zapus*), Preble, N. Am. Faun., 1899, No. 15, p. 20.

Type locality. Bear Lodge Mountains, Wyoming.

Geogr. Distr. Great Plains from Manitoba south to Nebraska, west to Colorado and Wyoming.

Genl. Char. Larger than *Z. hudsonius*, and brighter. Skull generally larger in relative proportions.

Color. Summer Pelage. Dorsal area distinct, suffused with ochraceous buff; sides ochraceous buff; feet and under parts white; tail dark gray above, yellowish white beneath.

Measurements. Total length, 222; tail vertebræ, 185; hind foot, 30.5.

395. tenellus. (*Zapus*), Merr. Proc. Biol. Soc. Wash., 1897, No. xi, p. 103.

Type locality. Kamloops, British Columbia.

Geogr. Distr. Known only from type locality.

Genl. Char. Small; ears large; color dark.

Color. Fall Pelage. Similar to *Z. hudsonius* but darker; dorsal area as in species mentioned; sides olive yellowish, lined with black; tail bicolor; outside of fore leg and thigh dusky; feet and lower parts whitish.

Measurements. Total length, 208; tail vertebræ, 128; hind foot, 30.5.

396. princeps. (*Zapus*), Allen, Bull. Am. Mus. Nat. Hist., 1893, p. 71.

Type locality. Florida, LaPlata County, Colorado.

Geogr. Distr. Rocky Mountain region from New Mexico north to Henry House, Alberta.

Genl. Char. Large; skull broad and large.

Color. Summer Pelage. Above yellowish brown mixed with black, sides yellowish brown sparsely mixed with blackish; lateral stripe clear yellowish brown; hind feet grayish white; tail pale brown above, grayish white beneath.

Fall Pelage. Dorsal area blacker; sides yellower.

Measurements. Total length, 245; tail vertebræ, 147; hind foot, 32.

a.—minor. (*Zapus*), Preble, N. Am. Faun., No. 15, 1899, p. 23.

Type locality. Wingard, near Carlton House, Saskatchewan.

Geogr. Distr. Saskatchewan Plains; range unknown.

Genl. Char. Similar to *Z. princeps*, but smaller, darker; rostrum more deflected, nasals narrow anteriorly; brain case higher; interpterygoid fossa shallower.

Measurements. Total length, 219; tail vertebræ, 131; hind foot, 29.9.

b.—oregonus. (*Zapus*), Preble, N. Am. Faun., 1899, No. 15, p. 24.

Type locality. Elgin, Blue Mountains, Oregon.

Geogr. Distr. Blue Mountains, Oregon.

Genl. Char. Similar to *Z. princeps*.

Color. “*Early Summer Pelage.* Very similar to *Z. princeps*, but slightly lighter on sides, especially anteriorly; dorsal area and head more finely flecked with color of sides, the head especially presenting a grayish appearance; beneath pure white; whitish edging of ears very indistinct.” (Preble, l. c.)

Measurements. Total length, 250; tail vertebræ, 154; hind foot, 33.

397. major. (*Zapus*), Preble, N. Am. Faun., 1899, No. 15, p. 24.

Type locality. Warner Mountains, Oregon.

Geogr. Distr. Type locality only.

Genl. Char. Similar to but larger than *Z. princeps*.

Color. Summer Pelage. Above ochraceous buff lined with black, heaviest on dorsal area; sides same color with less black; tail not sharply bicolor; lower parts and feet whitish.

Measurements. Total length, 255; tail vertebræ, 155; hind foot, 35.

398. nevadensis. (*Zapus*), Preble, N. Am. Faun., 1899, No. 15, p. 25.

Type locality. Ruby Mountains, Nevada.

Geogr. Distr. Known from type locality only.

Genl. Char. Large, color pale.

Color. Dorsal area pale yellowish brown, lined with black; side pale ochraceous buff; cheeks buffy white mixed with black; beneath pure white.

Measurements. Total length, 242; tail vertebræ, 150; hind foot, 33.

399. trinotatus. (*Zapus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 421.

imperator, Elliot, Pub. Field Columb. Mus., 1899, 1, p. 228, Zoölogy.

Type locality. Lulu Island, mouth of Fraser River, British Columbia.

Geogr. Distr. Coast region of southern British Columbia, Washington, Oregon west of Cascade Mountains, northern California to Humboldt Bay.

Genl. Char. Large, color bright.

Color. Summer. Above brownish black and buff; sides yellowish buff, sparsely streaked with black; inner side of legs, feet and under parts pure white. Tail, dark brown above, white beneath.

Measurements. Total length, 241; tail vertebræ, 141; hind foot, 28. (Spec. from Olympic Mts.)

a.—alleni. (*Zapus*), Elliot, Pub. Field Columb. Mus., 1898, 1, p. 212, Zoölogy.

Type locality. Pyramid Peak, Lake Tahoe, California.

Geogr. Distr. Mount Shasta southward in Sierra Nevada to Monmouth and north fork of Kern River, California.

Genl. Char. Similar to *Z. trinotatus*, color lighter; skull smaller. Tip of tail white.

Color. Above brownish black lined with deep fulvous; sides, outside of fore legs, thighs and rump, bright orange yellow sparsely lined with black. Under parts, hind legs and feet pure white. Tail, brown above, white beneath and white at tip.

Measurements. Total length, 234; tail, 143; hind foot, 32; ear, 14.

b.—montanus. (*Zapus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 104.

Type locality. Crater Lake, Mount Mazama, Oregon.

Geogr. Distr. Cascade Range in Oregon.

Genl. Char. Smaller than *Z. trinotatus*, colors duller, skull smaller.

Color. Summer Pelage. Dorsal area grizzled dusky and yellow; sides ochraceous buff lined with black; outsides of legs dusky to heels; beneath white. Tail, above dark gray, beneath whitish; feet soiled whitish.

Measurements. Total length, 228; tail vertebræ, 135; hind foot, 31.

400. orarius. (*Zapus*), Preble, N. Am. Faun., No. 15, 1899, p. 29.

Type locality. Point Reyes, California.

Geogr. Distr. Coast of California, Point Reyes north to Mad River, Humboldt Bay.

Genl. Char. Size medium, lower parts suffused with color of sides.

Color. Above dark ochraceous lined with black, sides similarly colored; legs ochraceous; feet yellowish white; beneath strongly suffused with ochraceous. Tail, above grayish, beneath yellowish white.

Measurements. Total length, 220; tail vertebræ, 127; hind foot, 30.

401. pacificus. (*Zapus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 104.

Type locality. Prospect, Rogue River Valley, Oregon.

Geogr. Distr. Southeastern Oregon and northwestern California.

Genl. Char. Large, tail one-half longer than head and body.

Color. Albinistic? "Dorsal area not sharply defined, but so strongly suffused with yellowish that the yellow predominates over the black; sides buffy yellow moderately lined with black hairs; inner sides of legs only slightly darkened, tail sharply bicolor; grayish above, white beneath; fore and hind feet soiled white." (Merriam, l. c.)

Measurements. Total length, 225; tail vertebræ, 141; hind foot, 31. Skull: basilar length, 17.5; zygomatic breadth, 12; mastoid breadth, 10; interorbital constriction, 4.5.

402. saltator. (*Zapus*), Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 3.

Type locality. Telegraph Creek, Northwest Territory, Canada.

Geogr. Distr. Telegraph Creek south to mouth of Skeena River and Tsimshian Peninsula; limits of range unknown.

Genl. Char. Similar to *Z. trinotatus*, but of smaller size.

Color. Fall Pelage. Dorsal area darkest and mixed with yellowish; sides yellowish lined with black; under parts and feet white; tail above dusky, beneath gray.

Measurements. Total length, 245; tail vertebræ, 145; hind foot, 32.

B. *Napeozapus*.

Premolar absent; sulcus on inner side of upper molars deeper; first and second molars equal in size; skull rather stout relatively.



FIG. 60. *NAPEOZAPUS INSIGNIS*.

No. 98799 U. S. Nat'l Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 8 times.

LOWER TOOTH ROW.
Enlarged 8 times.

403. *insignis*. (*Zapus*), Miller, Am. Nat., 1891, p. 472.

labradorius, (*Meriones*), Dawson, Edin. New Phil. Jour., N. S., 1856, 111, p. 2. (nec Kerr.)

Type locality. Restigouche River, New Brunswick.

Geogr. Distr. Eastern Canada south to western Maryland.

Genl. Char. Large; pale coloration; tail white-tipped.

Color. Dorsal stripe black mixed with buffy-yellow; sides buffy-yellow tinged with clay color; cheeks, fore neck and lateral line of body yellow; ears like back on outside, inside buffy-yellow; beneath white; tail above dark brown, tip white.

Measurements. Total length, 238; tail vertebræ, 146.7; hind foot, 31.1.

a.—*roanensis*. (*Zapus*), Preble, N. Am. Faun., 1899, p. 35.

Type locality. Roan Mountain, North Carolina.

Geogr. Distr. Only known from type locality.

Genl. Char. Smaller than *Z. insignis*, and darker colored. Skull smaller.

Color. Above "darker than *Z. insignis*; sides tawny ochraceous; beneath white; amount of white on tail averaging less than in *Z. insignis*."

Measurements. Total length, 220; tail vertebræ, 131; hind foot, 29.5. Skull: basilar length, 18.8; zygomatic breadth, 11.7; mastoid breadth, 10.1; interorbital constriction, 4.7.

b.—abietorum. (*Zapus*), Preble, N. Am. Faun., No. 15, 1899, p. 36.

Type locality. Peninsula Harbor, north shore of Lake Superior, Ontario.

Geogr. Distr. Limits of range unknown.

Genl. Char. Larger than typical *Z. insignis*. Comparative differences in skull and that of *Z. insignis*; molar series longer and heavier; interorbital constriction greater; ventral border of pterygoids nearly on plane of palate; maxillary process of zygoma shorter; mandible heavier.

Color. Indistinguishable from *Z. insignis*.

Measurements. Total length, 225; tail vertebræ, 160; hind foot, 33; ear, 16.6. Skull: basilar length, 19.4; zygomatic breadth, 12.2; mastoid breadth, 10.5; interorbital constriction, 4.3.

Fam. VIII. **Erethizontidae.**

Form stout; long acute spines loosely attached to skin; skull with facial portion short, and the jugal without inferior angle; molars more or less completely rooted.

Sub. Fam. I. **Erethizontinae.**

67. **Erethizon.**

$$I. \frac{1-1}{1-1}; P. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 20.$$

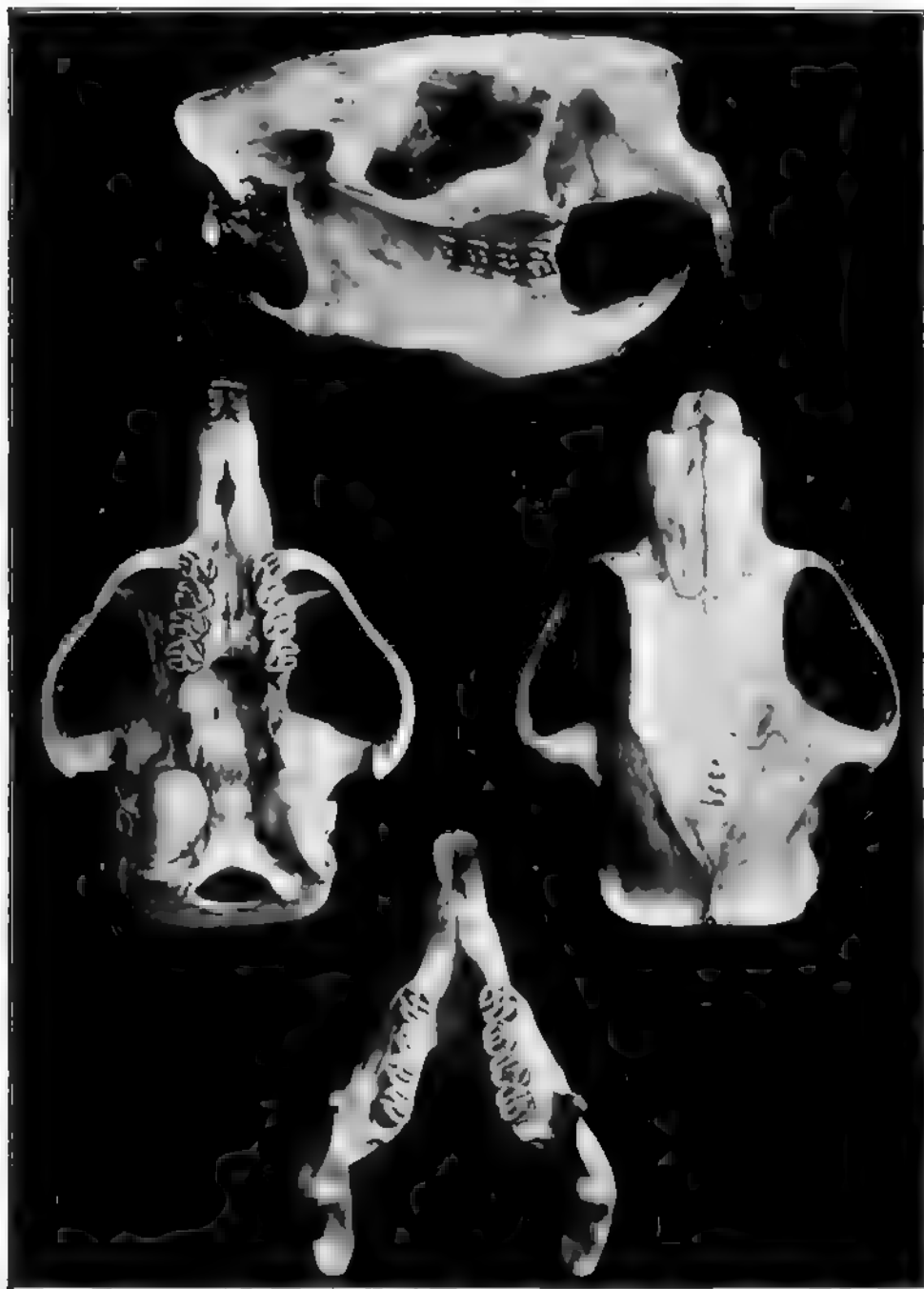
Erethizon. F. Cuv. Mém. du Mus., 1822, ix, p. 426. Type *H. dorsatus*, Linn.

Echinoprocta. Gray, Proc. Zool. Soc., 1865, p. 321.

Four toes on fore feet, five on hind feet, all with strong claws; limbs short, strong, no naked mesial line on upper lip, which is covered with hair and notched above the incisors; tail short, thick, non-prehensile, covered above with stiff hairs and spines, and on the sides and beneath with stiff bristles.

404. dorsatus. (*Hystrix*), Linn. Syst. Nat., 1758, p. 57, and 1766, 1, p. 76.

pilosus, Richard. (nec Peale), Faun. Bor. Amer., 1829, 214.



ERETHIZON DORSATUS.

No. 5359 Am. Mus. Nat. Hist. Coll. $\frac{3}{4}$ nat. size.

hudsonius, DeKay, N. Y. Zool., 1, 1842, p. 27, pl. xxv, fig. 1, pl. viii, 2, a. b. c.

Type locality. Eastern Canada.

Geogr. Distr. Canada west to Saskatchewan Plains, south to central Maine and northern New Hampshire and west of Connecticut River nearly to border of Massachusetts. Formerly it extended along the Alleghanies through Pennsylvania into Virginia and possibly to Kentucky. North it goes to the limit of trees.

Genl. Char. Light tips of long hairs of dorsal surface yellowish white; average length of nasals usually equal the interorbital breadth, or about one-third the length of skull. Nasal not extending to orbits, or one-third length of skull.

Color. Brownish black varied with yellowish white; quills white at base with terminal third usually black; a few are sometimes all black or all white; length of quills very variable; beneath brownish black.

Measurements. Total length, 900 to 1200; tail vertebræ, 150.

405. epixanthus. (*Erithrizon*), Brandt, Mém. Acad. St. Petersb., 1835, p. 389, pl. 1, 9.

pilosus, Peale (nec Rich.), U. S. Expl. Exped. Mamm., 1848, p. 46.

Type locality. California and Unalaska.

Geogr. Distr. From upper Missouri south in the mountains to New Mexico, west to the Pacific, northward from California to Alaska, probably to the tree limit.

Genl. Char. Light tips of long hairs of dorsal surface greenish yellow; average length of nasals exceed interorbital breadth, or over one-third the length of skull. Nasals extending backwards to the orbits, or two-fifths length of skull.

Color. Similar to *E. dorsatus*, except tips of long hairs are greenish yellow instead of yellowish white. Central line of belly sooty brown. Spines yellowish on the back, on the sides whitish tipped with brown.

Measurements. Total length, 825; tail vertebræ, 165.

a.—couesi. (*Erithrizon*), Mearns, Proc. U. S. Nat. Mus., 1897, p. 723.

Type locality. Fort Whipple, Arizona.

Geogr. Distr. Arizona and New Mexico.

Genl. Char. Smaller than *P. epixanthus*, paler coloration; audital bullæ greatly developed.

Color. Above brown, dorsum covered with white quills tipped with brown; long stiff hairs whitish at base. Muzzle, feet and under parts brown mixed with gray.

Measurements. Skull: total length, 86; audital bullæ, 21 x 16.7.

b.—myops. (*Erithrizon*), Merr., Proc. Wash. Acad. Scien., 1900, p. 27.

Type locality. Portage Bay, Alaska Peninsula.

Genl. Char. Similar to *E. epixanthus*; tail and hind feet shorter; face whiter; zygomata bowed outward, outer side convex; breadth between squamosal anteriorly, greater than that of occiput; outer wall of anteorbital vacuity straight, vertical.

Color. Similar to *E. epixanthus*, but flanks and sides of tail more yellow and fore part of head grayish.

Measurements. Total length, 630.

Fam. IX. Ochotonidae.

Form arvicoline; limbs subequal; external tail wanting. Skull flat, depressed; no postorbital processes; molars rootless; clavicles well developed.

68. Ochotona.

$$I. \frac{1-1}{1-1}; P. \frac{2-2}{2-2}; M. \frac{3-3}{3-3} = 24.$$

Ochotona. Link, Beitr. Nat., 1795, 11, p. 74.

Lagomys. Cuv. Règn. Anim., 1817, 1, p. 219.

Ogotoma. Gray, Ann. Mag. Nat. Hist., 1867, xx, p. 220.

Superior outline of skull arched, occipital region only slightly depressed; postorbital processes wanting, and the paroccipital processes undeveloped; malar prolonged almost to auditory opening; orbits open upwards, placing the zygomata on a higher level; occipital plane perpendicular, foramen magnum very large; audital bullæ greatly developed and extending backward to level of occipital plane; pterygoid fossa broad and deep, narrowing posteriorly; vomer joins basisphenoid; palate wider than long, merely a narrow bridge terminating posteriorly in a rounded arch. Skull above broad posteriorly with a slight sagittal crest, narrowing anteriorly; anteorbital constriction considerable; nasals extending backwards to orbits, truncated posteriorly, widest anteriorly. Condylod part of under jaw broad, quadrate, and slopes but little backward; coronoid process is a mere tubercle, and there is a second smaller tubercle near last molar. Mental foramen situated nearly opposite middle molar instead of being in fore part of jaw. Upper incisor broad, long and with a deep groove on outer side, dividing each tooth into unequal halves, and terminating in two points, the cutting edge being deeply notched and gauge-shaped instead of chisel-shaped. Lower molars are deeply grooved on the sides, causing the salient angles to be very prominent; first molar has two grooves on outer surface; last molar

with one external and one internal salient angle. Body nearly tailless; toes, five in front; four behind with short nails; and there is a prominent pad at base of each toe.

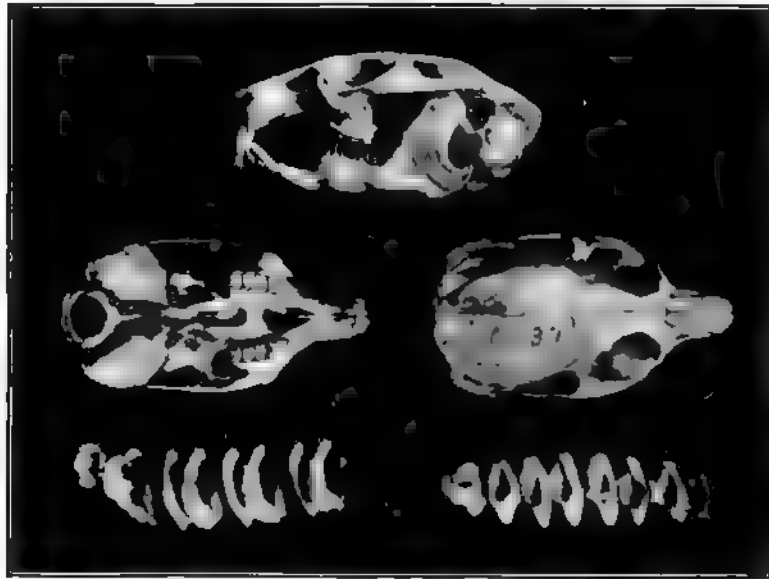


FIG. 61. OCHOTONA PRINCEPS.

No. 37 Field Columbian Museum Coll. Nat. size.

UPPER TOOTH ROW.
Enlarged 5 times.

LOWER TOOTH ROW.
Enlarged 5 times.

406. princeps. (*Lepus*), Richards, Zool. Jour., 1828, p. 520.

Type locality. River of the mountains, or south branch of the Mackenzie.

Geogr. Distr. Rocky Mountains in British Columbia, northward to south branch of the Mackenzie River.

Genl. Char. Head yellowish brown; ears large, nearly round; head broad, forehead arched; bullæ large.

Color. Head and shoulders yellowish brown; rest of upper parts grayish black; sides yellowish brown; under parts smoke gray tinged on chest and parts of belly with brown. Ears bordered with white; feet white, soles dusky brown.

Measurements. Total length, 172; hind foot, 27; ear, 25.

407. schisticeps. (*Lagomys*), Merr., N. Am. Faun., No. 2, 1889, p. 11.

Type locality. Donner, California.

Geogr. Distr. Sierra Nevada Mountains, California.

Genl. Char. Head gray; anterior margin of palate produced forward in a sharp point; supraoccipital appears in the vault of the cranium as a narrow bridge between the mastoids.

Color. Top of head from nose to nape, slate gray; rest of upper parts suffused with fulvous deepest on sides; black tipped hairs distributed over back. Feet and under parts white washed with fulvous; soles of hind feet dusky; fore feet yellowish white.

Measurements. Total length, 188; tail vertebræ, 9.5; hind foot, 29.5; ear from crown, 6.

408. collaris. (*Lagomys*), Nelson Proc. Biol. Soc. Wash., 1893, p. 117.

Type locality. Near head of Tanana River, Alaska.

Geogr. Distr. Mountains south of Fort Yukon from head of Tanana River to the Chigmit Mountains near the head of Bristol Bay, Alaska.

Genl. Char. Ears thickly haired, iron gray collar; palatine bridge broad and heavy and slightly concave on both borders, "angular process of mandible terminates in a short point rising vertically behind the concavity of the notch."

Color. Above nearly uniform grizzled gray, tinged with yellowish on crown and back. A broad iron-gray collar on back and sides of neck, chin and throat white. Back of ear a pale ashy patch; a dull gray band behind white throat; yellowish spot on each side of throat; feet, legs and under parts white; soles of feet smoky brown; margin of ear pale grayish white; the interior has a yellowish band across middle and a black bar along edge.

Measurements. Total length, 182; hind foot, 28.3; ear, 19.1.

409. cuppes. (*Ochotona*), Bangs, Proc. New Engl. Zool. Club, 1899, p. 40.

Type locality. Monishe Divide, Gold Range, British Columbia.

Geogr. Distr. Gold Range, British Columbia.

Genl. Char. "Colors dark with much tawny on head, neck and under parts; skull similar to that of *O. minimus*, with short nasals and rostrum, rather large audital bullæ, and short palatine fossa."

Color. Above rich brown; cheeks, sides of neck and lower sides tawny ochraceous mixed with black; patch of buff behind ears; chin buffy, band beneath neck tawny ochraceous; under parts dull ochraceous, base of fur slate gray; feet above buffy; soles dusky; border of ears white; grayish band inside below border.

Measurements. Total length, 190; hind foot, 30.

410. saxatilis. (*Ochotona*), Bangs, Proc. New Eng. Zool. Club, 1899, p. 41.

Type locality. Snowy Range, Montgomery Park County, Colorado.

Geogr. Distr. Snowy Range, Colorado; limits not known.

Genl. Char. Large; color pale; "skull wide between orbits; nasals and rostrum very long; palatine fossa long and narrow; palatal bridge narrow, its anterior edge falling far back."

Color. Above pale yellowish brown mixed with black on head and back; cheeks, sides of neck and sides tinged with buff; under parts buffy white to deep buff; feet buff, soles dusky; ear bordered with white, grizzled gray inside.

Measurements. Total length, 182; hind foot, 30.5.

411. minimus. (*Lagomys*), Lord, Proc. Zool. Soc., 1863, p. 98.

Type locality. Ptarmigan Hill, Cascade Range, British Columbia.

Geogr. Distr. British Columbia near boundary line; limits of range unknown.

Genl. Char. Small; color dark; skull smaller relatively in all its parts than that of *O. princeps*.

Color. Above dark gray tinged with yellow, most perceptible about shoulders; sides and belly dirty white; feet yellowish brown; ear black inside, bordered with white outside.

Measurements. Total length, 164; ear from base behind, 25.

*Fam. IX. **Leporidae.**

Hind legs greatly elongated; ears very long; tail rudimentary, bushy; skull flat; postorbital processes well developed; rami of mandible flat, deep; facial surface of maxilla perforated; all openings large; palate a mere bridge between molars; clavicles imperfect.

69. **Lepus.**

$$I. \frac{2-2}{1-1}; P. \frac{3-3}{2-2}; M. \frac{3-3}{3-3} = 28.$$

Lepus. Linn. Syst. Nat., 1758, p. 57. Type *L. timidus*.

Hydrolagus. Gray, Ann. Mag. Nat. Hist., 1867, xx, p. 221 (nec Gill, Pisc., 1862).

Silvilagus. Gray, Ann. Mag. Nat. Hist., 1867, xx, p. 222.

Microtolagus. Mearns, Proc. U. S. Nat. Mus., 1895, p. 552.

Limnolagus. Mearns, Science, N. S., 1897, v, p. 393.

Microlagus. Trouess. Cat. Mamm. vivent. quam fossil., 1897, 3, p. 66.

Skull high, superior outline much curved, especially at occipital region; postorbital processes in the majority of species long, more or less divergent, flanking a deep, wide notch, their posterior extremi-

*This Family is greatly in need of a careful, impartial revision.

ties not completely fused with skull (exceptions to this are the swamp hares which have this process anchylosed to the cranium by its tip, or its internal margin); all the openings of the skull are large; facial surface of the maxilla reticulated; orbits very large, meeting in the mesial line of the cranium; teeth more numerous than in any other family of rodents; second pair of upper incisors small, situated behind the chief pair; the latter is grooved deeply in front, and all are deeply implanted in the jaws; molars rootless; third upper molar minute; last lower molar larger, but still much the smallest of the lower series. The scapula ends in a process, which has near its termination a band directed at right angles to the scapula; tibia and fibia always anchylosed; front feet with five toes, hind feet with four. A patch of hair-covered skin on inner surface of cheeks extending backward from the angle of mouth. Hind legs elongated, in some species greatly so.

412. arcticus. (*Lepus*), Leach, in Ross Voy. Arct., Reg., 11, 1819, App., iv, p. 151.

glacialis, Leach, in Ross Voy. Arct., Reg., 11, 1819, App., iv, p. 170.

timidus var. *arcticus*, Allen, Mon. Rod., 1876, p. 288.

Type locality. Shores of Baffin Bay.

Geogr. Distr. Newfoundland, Labrador, west shore of Hudson Bay, north shore of Great Slave Lake and Barren Grounds to the Arctic Ocean; west of the mountains in the Upper Yukon Valley.

Genl. Char. Size very large; ears four-fifths the length of head; hind foot longer than the head. Total length of skull twice the greatest breadth.

Color. Summer Pelage. White, mixed sparingly with brown and gray, the long hairs black pointed. Face and ears tawny gray, the latter with black tips. Pelage white to the base.

Winter Pelage. Pure white. Specimens from more southern localities are darker in summer, intergrading into *L. a. bangsi*.

Measurements. Total length, 660; hind foot, 147; ear, 118. Specimen from Baffin Bay.

a.—bangsi. (*Lepus*), Rhoads, Am. Nat., 1896, p. 236.

Type locality. Codry, Newfoundland.

Geogr. Distr. Newfoundland, northern Labrador; limits not determined.

Genl. Char. Size large; as compared with the European hare, the ears are shorter, skull broader, and frontals narrower.

Color. Summer Pelage. Above grizzled gray tinged with tawny; crown and cheeks grizzled buffy gray; chin, underneath head, pectoral band, lower sides, edges of rump and fore legs plumbeous gray

lined with white; under parts white; tail white. Outer sides of legs and feet tawny gray; ears black, grayish at base bordered posteriorly with white. Whiskers equally white and black.

Measurements. Total length, 626; tail vertebræ, 63; hind foot, 160; ear from crown, 85.

413. labradorius. (*Lepus*), Miller, Proc. Biol. Soc. Wash., 1899, p. 39.

Type locality. Fort Chimo, Ungava, Labrador.

Geogr. Distr. Ungava, Labrador; limits of range not known.

Genl. Char. Similar to *L. a. bangsi* from Newfoundland, hind foot shorter, ears longer. Audital bullæ more inflated, rising above the surface of the basioccipital and of the highest point of the occipital condyle.

Color. Summer Pelage. Above hair brown tinged with bluish gray and frosted with whitish; head pale hair brown, darkest on crown and forehead. Ears black at tip; grizzled black and hair brown anteriorly, whitish behind. Rump and sides gray; beneath white. Feet white tinged with brown; soles umber brown. Tail white.

Measurements. Hind foot, 142; ear from crown, 105; to end of hairs, 110.

414. groenlandicus. (*Lepus*), Rhoads, Amer. Nat., 1896, p. 254.

Type locality. Robinson Bay, North Greenland.

Geogr. Distr. Greenland; possibly Iceland and Spitzbergen.

Genl. Char. Size large; incisors very long and slender; "face of upper incisors multistriate, the normal sulcus so filled with dentine in adults as to obliterate the depression."

Color. Summer Pelage. White suffused with light tawny and sprinkled with gray on top of head and ears. Scattering black and gray hairs on back. Sides, under parts and tail white.

Measurements. Total length, skeleton from nasals to last caudal vertebræ, 519; hind foot, 145; tail vertebræ, 50; ear from crown, 100. (Dry skin.)

415. tschukschorum. (*Lepus*), Nordquist, Vega Exped., 11, 1883, p. 84, figs. 8, 9, 10.

Type locality. Pitlekaj, lat. 67° N., long. 173° W., northeast Siberia.

Geogr. Distr. Northwest Alaska, from mouth of Kuskoquim River to Arctic Ocean; Siberia.

Genl. Char. Similar to *L. timidus*, but larger head; ears shorter, black on tips much less. Nasals smaller and narrower, postorbital

processes more developed; upper incisors long and wide. (Nordquist.)

Color. Summer Pelage. Above, head and body blackish brown; sides of head, neck and body grayish brown. Dorsal line smoky black tipped with tawny; rump black. Orbital ring white; cheek and nose rusty black; chin, throat, lower part of neck, rest of under parts and lower parts of limbs white; fore feet tawny gray, hind feet whitish. Ears brownish black mixed with tawny; tawny gray and black inside; posterior borders white, tips black. Whiskers white. Some black hairs at base of tail above.

Pelage. Entirely white except black tips to ears, and soles of feet, which are yellowish white. Weight 12–14.5 pounds.

Measurements. Total length, 610–710; tail vertebræ, 70–80; hind foot, 170–179; ear, 130–135. Skull: greatest length, 108–115.5; greatest breadth, 55.5–56; length of nasal, 41.5–46; breadth of nasals at base, 23–25; width upper incisor at tip, 2.6; alveolar width of upper incisor, 3; alveolar length of upper molar series, 20.

416. othus. (*Lepus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 28.

Type locality. St. Michaels, Alaska.

Genl. Char. Size large, winter pelage white except tips of ears, which are black.

Skull, as compared with *L. tschukshorum*, differs in having the “frontals slightly broader interorbitally; nasals narrower and less flattened; supraoccipital shield narrower, much longer than broad; jugal decidedly narrower, longer posteriorly, and with muscular impression on outer face decidedly narrower anteriorly; basioccipital narrower; incisive vacuity smaller.”

Measurements. “Hind foot, 174. Skull: basal length, 86.5; zygomatic breadth anteriorly, 49; at widest point, 52; postpalatal length, 46.5; greatest breadth across postorbital processes, 39; greatest breadth of nasals posteriorly, 22; anteriorly, 20.” (Merr.)

417. poadromus. (*Lepus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 29.

Type locality. Stepovak Bay, Alaska Peninsula.

Genl. Char. Smaller than *L. othus*; hind feet and tail shorter; skull narrower.

Color. Head fulvous; orbital ring buffy; ears fulvous and black anteriorly, white posteriorly, with basal third of anterior margin white; back, sides and hind legs gray mixed with black and buff; fore legs grizzled grayish fulvous; dull fulvous on upper side of feet; hind feet white. Tail dusky on upper median line, rest grayish white; grayish collar on throat; breast, middle of belly and inner sides of legs white.

Measurements. Hind foot, 152; ear from notch, 80. Skull: basal length, 82; zygomatic breadth anteriorly, 47.5; postpalatal length, 43; breadth across postorbital processes, 37; breadth of nasals posteriorly, 20; anteriorly, 16.

418. americanus. (*Lepus*), Erxleb., Syst. Regn. Anim., 1777, p. 330. *hudsonius*, Pall., Glir., 1778, p. 30.

nanus, Schreb. Säug., 1792, 11, pl. 234 B.

campestris, Hayden, Am. Nat., 111, 1869, p. 115, (*Partim.*)

borealis, Schinz, Synop., 11, 1845, p. 286.

Type locality. Hudson Bay?

Geogr. Distr. From New Brunswick and Nova Scotia northward to the limit of trees, and westward to Alaska.

Genl. Char. Hairs in winter with a narrow middle band of reddish brown; size medium.

Color. Above reddish or cinnamon brown; beneath white; ears black at tip behind, extending down margins; posterior edge white. Tail above sooty brown, beneath grayish.

Measurements. Total length, 634; tail vertebræ, 97; hind foot, 142; height of ear, 108.

a.—phaeonotus. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 1899, pl. 11.

Type locality. Hallock, Kittson County, Minnesota.

Geogr. Distr. Central and northern Minnesota; limits of range unknown.

Genl. Char. Similar to *L. americanus*, but smaller and grayer.

Color. Summer Pelage. Above pale yellowish gray mixed with black; top of head suffused with fulvous; median black dorsal line, indistinct; beneath white, pectoral band brown.

Winter Pelage. Like *L. americanus*, save the extent of fulvous under fur is less and paler.

Measurements. Total length, 488; tail vertebræ, 56; ear from crown, 88; hind foot, 139.

b.—virginianus. (*Lepus*), Harlan, Faun. Amer., 1825, p. 196, nec p. 310.

Type locality. Blue Mountain, Pennsylvania.

Geogr. Distr. Atlantic coast from Nova Scotia to Connecticut, and in the Alleghanies south to Virginia; through the northern part of the border tier of States and the southern half of Canada; west to north shore of Lake Superior and northern Minnesota to the Missouri River.

Genl. Char. Winter Pelage. White at surface, plumbeous at

base with a broad reddish brown band between, showing through to the surface. As large or even larger than *L. americanus*.

Color. Summer Pelage. General color cinnamon brown, more reddish than *L. americanus*, beneath white.

Winter Pelage. Frequently less complete than in *L. americanus*, and the brown color visible through the surface, and sometimes the color of the summer pelage predominates even in midwinter. Again specimens are found that are perfectly white save the black tips of the ears.

Measurements. Total length, from 350–500; hind foot, 117–140; length of ear, 60–90.

c.—struthopus. (*Lepus*), Bangs, Proc. Biol. Soc. Wash., 1898, p. 81.

Type locality. Digby, Nova Scotia.

Geogr. Distr. Province of Nova Scotia, limits of range unknown.

Genl. Char. Size of *L. a. virginianus*; hind foot shorter; color darker, rarely with reddish brown shades.

Color. Summer Pelage. Above varying from raw umber to bister, sometimes shaded on head, neck and flank with dull ferruginous; back lined with black; chin and belly white; ear brown, tips black, border yellow; feet dusky. *Winter Pelage.* White.

Measurements. Total length, 474.77; tail vertebræ, 49.83; hind foot, 27.38.

d.—bairdi. (*Lepus*), Hayden, Am. Nat., 1870, iii, p. 115.

Type locality. Wind River Mountains.

Geogr. Distr. Higher portion of the Rocky Mountains from Great Slave Lake, Arctic America, south to New Mexico.

Genl. Char. Winter Pelage. Sometimes hairs almost pure white to the base; generally the base is light plumbeous, of small extent, and the middle band a pale fulvous or salmon.

Color. Summer Pelage. Above pale grayish brown mixed with black; black sometimes predominating; under fur whitish; middle brown band nearly obsolete; feet and under parts white; ears black, tinged with whitish, the borders white. Top of head rufous. *Winter Pelage.* White.

Measurements. Total length, 360–460; tail vertebræ, 44; hind foot, 140; ear, 82.

e.—washingtoni. (*Lepus*), Baird, Proc. Acad. Nat. Scien. Phil., 1855, p. 333, pl. 15.

Type locality. Washington, vicinity of Puget Sound.

Geogr. Distr. North latitude 55° south to mouth of Willamette River, Oregon.

Genl. Char. Small; represents *L. a. virginianus* on Pacific coast, with a more reddish tint. In the vicinity of Puget Sound this hare does not turn white in winter.

Color. Upper parts, throat and sides of head and body and outer surface of limbs reddish brown, lined with black on the back; beneath white; tail above lead color, below rusty white. Under fur on back plumbeous; ears black at tip and on the posterior margin of the inner surface; rest pale reddish brown. In the northern part of its dispersion this species turns white in winter.

Measurements. Total length, 481; hind foot, 110; ear, 81.

f.—columbiensis. (*Lepus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1895, p. 242.

Type locality. Vernon, British Columbia.

Geogr. Distr. Arid interior basin of southern British Columbia.

Genl. Char. Size equal to *L. americanus*; color grayish, with absence of rufous above.

Color. Summer Pelage. Above pale tawny gray, blackish on rump; crown cheeks, legs and feet light rusty; under parts white, grading into bluish gray on lower abdomen. Tail above tawny gray, below bluish gray; ears at base rusty; anterior terminal border, black.

Measurements. Total length, 465; tail vertebræ, 43; hind foot, 140; ear, 72.

g.—dalli. (*Lepus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 29.

Type locality. Nulato River, Alaska.

Cranial Char. Subspecies only known from skull. Compared with typical *L. americanus*, "the skull of *L. dalli* is very much larger; rostrum, nasals and incisive vacuity decidedly longer; jugal longer and more expanded posteriorly; molariform teeth larger." (Merr., l.c.)

Measurements. Skull: basal length, 65; zygomatic breadth anteriorly, 37.5; at middle, 38; postpalatal length, 33.5; frontal breadth across middle of postorbital processes, 21; breadth of nasals posteriorly, 15; anteriorly, 11.

h.—macfarlani. (*Lepus*), Merr., Proc. Wash. Acad. Scien., 1900, p. 30.

Type locality. Fort Anderson, north of Great Bear Lake, Arctic America.

Cranial Char. "Skull similar to typical *L. americanus*, but larger and heavier; nasals broad; brain case less flat; supraoccipital shield narrower and tapering posteriorly; mandible, molars and lower incisors large."

Measurements. Basal length, 67; zygomatic breadth anteriorly,

38.5; at middle, 41; postpalatal length, 34.5; frontal breadth across middle of postorbital processes, 21; breadth of nasals posteriorly, 17.5; anteriorly, 14. (Merr., l. c.)

419. *saliens*. Osgood, N. Am. Faun., 1900, No. 19, p. 39.

Type locality. Caribou Crossing, between Lake Bennett and Lake Tagish.

Geogr. Distr. Limits of range unknown.

Genl. Char. Similar to *L. a. bairdi*, but more yellowish. Audital bullæ very large.

Color. Worn Spring Pelage. Above black and yellowish buff; ill defined black dorsal stripe; edge of thighs, outer side of fore legs and pectoral band buff; head and ears buff, with black intermingled; ears margined with white; nose gray; feet white, mixed with rufous; under parts white.

Measurements. Total length, 395; hind foot, 134; ear from crown, 74. Skull: occipito-nasal length, 77; zygomatic breadth, 38; nasals, 33; molar series, 15. (Osgood.)

420. *bishopi*. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 11.

Type locality. Mill Lake, Turtle Mountains, North Dakota.

Geogr. Distr. Limits of range not known.

Genl. Char. Small; ears very small; hind foot not so long as that of *L. americanus*.

Color. Summer Pelage. Above grayish brown tinged with yellowish; blackish dorsal stripe; head yellowish brown; sides pale buffy gray; beneath white; pectoral band pale yellowish brown; outside of fore legs yellowish brown; hind feet yellowish brown; ears yellowish brown tipped with black; outer edge white.

Measurements. Total length, 350; tail vertebræ, 45, hind foot, 115; ear from crown, 55. Skull: total length, 75; zygomatic breadth, 35; mastoid, 29; postorbital constriction, 13; length of nasals, 28.

421. *klamathensis*. (*Lepus*), Merr., N. Am. Faun., No. 16, 1899, p. 100.

Type locality. Fort Klamath, Oregon.

Geogr. Distr. Oregon, limits of range not known.

Genl. Char. Similar to *L. a. columbiensis*; white stripe on hind foot; bullæ small; outer face of jugal grooved anteriorly, and upper ridge reaching anteriorly beyond end of groove.

Color. Summer Pelage. Above fulvous and black; head, face and pectoral collar dull fulvous; chin throat and belly white; white stripe along upper surface of hind foot.

Winter Pelage. Snow white; or sometimes with summer pelage unchanged.



LEPUS (LIMNOLAGUS, TEUMALEMONUS
No 191 Field Columbian Museum Coll. Nat size.

Measurements. Total length, 432; tail vertebræ, 28; hind foot, 127.

422. campestris. (*Lepus*), Bachm. Jour. Acad. Nat. Scien. Phil., 1837, p. 349.

virginianus, var. Harlan, Faun. Amer., 1825, p. 310. (nec p. 196.)

townsendi, Bachm. Jour. Acad. Nat. Scien. Phil., 1839, p. 90, pl. 2.

Type locality. Valley of the Saskatchewan.

Geogr. Distr. Middle Kansas northward to the plains of the Saskatchewan, and from eastern limits of the Great Plains westward to the Sierra Nevada Mountains.

Genl. Char. Larger than *L. americanus*, hind feet longer than ears, tail all white, long.

Color. Summer Pelage. Entire upper parts, sides of legs, throat and pectoral band yellowish gray mixed with dark brown; sides paler; nape smoky white; under surface of head and belly white; legs gray tinged with rusty; tail entirely white. Fringe and border of ears white.

Winter Pelage. Pure white; in southern localities this hare does not always turn entirely white, and the head and dorsal surface are frequently reddish brown, sometimes almost a pinkish buff.

Measurements. Total length, 630; tail vertebræ, 95; hind foot, 153; ear from crown (dried skin), 125.

A. *Limnolagus*.

“Interparietal present as a distinct bone in adults; usually developed from a single ossific center. Skull and teeth massive; rostral portion wide as high; postorbital process of frontals ankylosed with the cranium for its entire length; frontals and parietals deeply pitted; skull rather straight above, about half as wide as long; pelage harsh; head small; ear, tail and hind foot short, latter scantily haired.” (Mearns, Proc., U. S. Nat. Mus., 1895, p. 551, as *Hydrolagus*. Gray).

423. aquaticus. (*Lepus*), Bach. Jour. Acad. Nat. Scien. Phil., 1837, p. 319, pl. 22, fig. 2.

Type locality. Alabama.

Geogr. Distr. Gulf States from Alabama to Texas and northward to southern Illinois in the interior, about Mound City and Cairo; up the Ohio to the Wabash River and “on the Mississippi to Cape Girardeau, and possibly higher where swamps extend.”

Genl. Char. Large or longer than *L. americanus*, ears less than length of head; hind foot average shorter than head; incisors very large.

Color. Above yellowish brown lined with black; sides pale and with less black; breast dusky yellowish brown; chin and belly white; tail above dusky reddish brown; beneath white; black spot on forehead; feet dark chestnut brown; ears dark brown, bordered with white in front, with fulvous behind. Sides of head with sometimes a black patch on cheeks. Nape reddish brown.

Measurements. Total length, 530; tail vertebræ, 40; hind foot, 119; ear, 76.

a.—attwateri. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 327.

Type locality. Medina River, 18 miles south of San Antonio, Texas.

Geogr. Distr. Southeastern Texas, limits not known.

Genl. Char. Color paler than those of *L. aquaticus*. Size similar.

Color. Above pale buffy gray lined with black; sides whitish gray tinged with buff; dorsal region tinged with yellowish, darkest on the rump; belly and inside of legs white. Back sometimes nearly all black; ears sparsely haired, reddish brown outside, with a narrow white border anteriorly; curved black line at corner of eye across cheek; tail reddish brown above, white below; feet fulvous above, soles dusky.

Measurements. Total length, 520; tail to end of hairs, 83; hind foot, 105; ear, 65.

424. *telmalemonus.* (*Lepus*), Elliot, Pub. Field Columb. Mus., 1899, 1, p. 285, Zoölogy.

Type locality. Washita River, near Dougherty, Indian Territory.

Geogr. Distr. Indian Territory, limits of range unknown.

Genl. Char. Sexes unlike. Male with pale silvery gray color; female yellowish buff; side large. Nasals very broad, 16 mm. posteriorly.

Color. Male. Sides of face and flanks silvery gray; upper parts silvery gray tinged with yellow, becoming pale brown at base of tail; all the hairs tipped with black, bases plumbeous. Dorsal surface but slightly darker than flanks. Back of neck chestnut. Nose to crown light buff lined with black; back of head light gray with a narrow black line down the center. Around eye light buff broadest posteriorly. Broad black lines across cheeks. Upper and under surface of fore legs pale fulvous, same spots on hind legs inclining to white. Broad pectoral band pale fulvous. Rest of under parts and inside of legs white. Ears light buff heavily lined with black; inside pearly gray. Tail snuff brown above, hairs tipped with fulvous, beneath white.

Female. General appearance pale yellowish suffused with reddish brown. Upper parts and flanks yellowish buff, hairs tipped with amber brown, darker on dorsal area, and almost blackish brown on the rump. Head and back of neck as in the male. Ears like the back outside, inside buff along the margin. Pectoral band, under parts, feet and tail like the male.

Measurements. Male. Total length, 540; tail, 75; hind foot, 110; ears from notch, 69.

Female. Total length, 560; tail, 86; hind foot, 110.

425. palustris. (*Lepus*), Bachm. Journ. Acad. Phil., 1837, p. 194, pls. 15, 16.

douglasi, Gray, Ann. and Mag. Nat Hist., 1837, p. 586.

Type locality. South Carolina?

Geogr. Distr. North Carolina to Florida, westward through the Gulf States to Texas; south to Yucatan.

Genl. Char. Size of *L. f. mallurus*, tail shorter; ears broader, more rounded; head larger; nails of toes exposed; incisors and molars broader and heavier.

Color. Above yellowish brown, tinged with rufous or rusty (the latter especially on the rump and outside of legs), and heavily shaded with black; beneath grayish white; breast and sides yellowish brown; chin grayish white; throat brownish gray; ear grayish rufous lined with black. Tail above rufous and black, beneath grayish white. Soles brownish.

Measurements. Total length, 444; tail vertebræ, 38; hind foot, 88; ear, 64.

a.—paludicola. (*Lepus*), Miller & Bangs, Proc. Biol. Soc. Wash., 1894, p. 105.

Type locality. Fort Island, near Crystal River, Florida.

Geogr. Distr. Southern Florida.

Genl. Char. Similar to *L. palustris*, hind foot shorter, ear shorter, color darker, more rufous. Rostrum short, broad.

Color. Above russet lined heavily with black, the latter predominating on back and sides of the head and neck; nape patch russet; beneath smoky gray; lower part of flanks light cinnamon rufous; pectoral band wood brown; ears dark russet, bordered anteriorly with white and an inner line of black; feet above pale russet, soles seal brown.

Measurements. Total length, 438; tail vertebræ, 35; hind foot, 84; ear, 4.5; (dried skin).

B. Silvilagus.

“Interparietal persistent as a distinct bone in adults; rostrum wider than high; skull and teeth light; postorbital process united with cranium behind, inclosing a narrow foramen; upper surface of skull less pitted; skull sometimes wider than half its length, much arched; pelage softer.” (Mearns.)

426. floridanus. (*Lepus*), Allen, Bull. Amer. Mus. Nat. Hist., 1899, p. 160.

Type locality. Sebastian River, Brevard County, Florida.

Geogr. Distr. North Carolina to Florida west to Louisiana.

Genl. Char. Similar to *L. f. mallurus*, Thomas, but darker in color.

Color. Above buffy gray mixed with black; legs dark rufous; pectoral band broad; dark grayish; ears broadly edged and tipped with black; space about eye grayish white, not creamy white; under parts grayish white.

Measurements. Total length, 455; tail to end of hairs, 65; hind foot, 84; ear from notch, 57.

a.—mallurus. (*Lepus*), Thomas Ann. Mag. Nat. Hist., 1898, p. 320.
sylvaticus, Bachm. Jour. Acad. Nat. Scien. Phil., 1837, p. 403,
(nec Nillson.)

Type locality. Raleigh, North Carolina.

Geogr. Distr. Southern Maine along the coast to Florida and the Gulf States, west to eastern Kansas, Nebraska and the Indian Territory. In the states bordering on the Mississippi it grades into *Lepus nuttalli*; and in Arizona into *Lepus arizonæ*. In the interior its range is limited apparently by the northern boundary of the United States.

Genl. Char. Hind foot and ears longer than head.

Color. Above yellowish brown lined with black; rump ash, gray and black; nape, fore legs, and outside of hind legs rusty; throat yellowish gray; under parts white. Tail above yellowish brown, beneath white. Ear ashy brown edged with white posteriorly; towards the top black. Fur lead color at base.

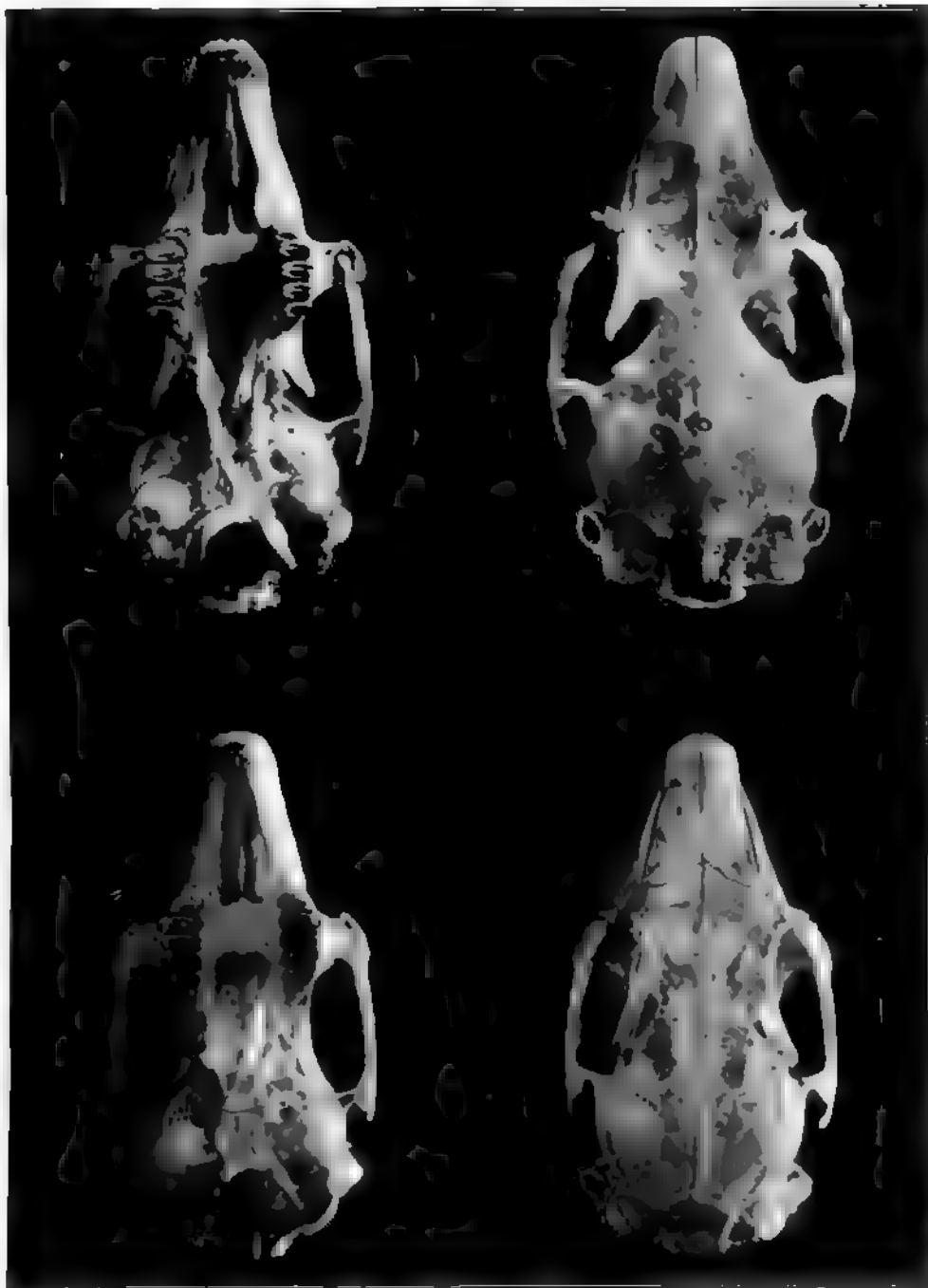
Measurements. Total length, 477; tail vertebræ, 64; hind foot, 142; ear, 55.

b.—mearnsi. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 171
(note).

Type locality. Fort Snelling, Minnesota.

Geogr. Distr. Iowa, Wisconsin and Minnesota.

Genl. Char. Similar to *L. floridanus mallurus*, but larger; color slightly paler, especially on the sides of the body.



LEPUS AMERICANUS.

No. 587 Field Columbian Museum Coll. Nat. size.

LEPUS (SILVILAGUS) FLORIDANUS.

No. 606 Field Columbian Museum Coll. Nat. size.

Color. Above pale yellowish brown sparsely mixed with black, becoming grayish on the rump; top of head reddish brown finely lined with black; sides and outside of thighs grayish white, mixed with black and extending onto sides of belly; fore legs pale yellowish; hind legs and feet rufous brown on sides, whitish on upper surface. Tail blackish above, the hairs white tipped, beneath pure white. Beneath head (chin and jaws), pale plumbeous, throat and breast yellowish brown; rest of under parts white. Ears yellowish brown, a dusky brown line along outer edge to tip.

Measurements. Total length, 475; tail vertebræ, 66; hind foot, 105.

c.—*transitionalis*. (*Lepus*), Bangs, Proc. Bost. Soc. Nat. Hist., 1895, p. 405.

Type locality. Liberty Hill, New London County, Connecticut.

Geogr. Distr. East side of lower Hudson River, New York, along the Alleghanies to West Virginia, north to southern New Hampshire and west to Hudson River.

Genl. Char. Skull, as compared with that of *L. floridanus*, is shorter and broader; postorbital process of the frontal bone slender and short, enclosing (not always entirely) a foramen; incisive foramen has the two outer sides parallel for two-thirds the length, turning suddenly in and then continuing up behind incisors, making a bottle-shaped opening.

Color. Above russet and wood brown mixed with black; nuchal patch hazel, as are the outside of legs; pectoral band wood brown; under parts white; ears wood brown and russet, outer edge with a black margin fringed with yellowish white. Tail sooty black; hairs tipped with pale brown; beneath white.

Measurements. Total length, 431; tail vertebræ, 52.5; hind foot, 99; ear, 58.

d.—*bachmani*. (*Lepus*), Waterh., Proc. Zöol. Soc., 1838, p. 103.

trowbridgei, Baird, Journ. Acad. Nat. Scien. Phil., 1855, p. 333.

Type locality. "S. W. coast of North America, probably California."

Geogr. Distr. Fort Crook to Cape St. Lucas, California.

Genl. Char. Similar to *L. f. auduboni*, but smaller; ears equal to head in length; hind feet short; tail almost rudimentary; ears uniformly gray.

Color. Above yellowish brown mixed with dark brown; throat, chest and sides paler; legs and hind feet whitish, tinged with rufous; ears gray, at extreme base rusty; no black edging at tip; fur every-

where lead color at base. Beneath dusky gray, sometimes whitish; nape rufous; tail black, hairs tipped with pale brown.

Measurements. Total length, 340; tail vertebræ, 30; hind foot, 75; ear, 61.

e.—alacer. (*Lepus*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 136.

Type locality. Stilwell, Indian Territory.

Geogr. Distr. Missouri south to Indian and Oklahoma Territories, limits of range unknown.

Genl. Char. Size of *L. f. bachmani*, but darker in color; audital bullæ smaller.

Color. Above reddish brown, lined with black; nape and upper surface of legs cinnamon rufous; sides and rump wood brown; pectoral band wood brown; rest of under parts white.

Measurements. Total length, 370; tail vertebræ, 50; hind foot, 95; ear, 73. Skull: occipito-nasal length, 67.2; zygomatic breadth, 34.

f.—ubericolor. (*Lepus*), Miller, Proc. Acad. Nat. Scien. Phil., 1899, p. 383.

Type locality. Beaverton, Oregon.

Geogr. Distr. Northwestern Oregon, limits of range unknown.

Genl. Char. Darker and redder than *L. f. bachmani*.

Color. Grizzled brown and black, darkest on the back; nape chestnut; ear blackish, sprinkled with broccoli brown and frosted on the inside and at base. Edge of ear wood brown; chin, upper part of throat and belly cream buff. Feet brown. Tail above brown and black, beneath white.

Measurements. Total length, 280; tail vertebræ, 15; hind foot, 75; ear from crown, 55.

g.—chapmani. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 1899, p. 12.

Type locality. Corpus Christi, Texas.

Geogr. Distr. Texas, common in chaparral region south of Bexar county.

Genl. Char. Size small; sides and rump whitish gray.

Color. Above yellowish brown and black, becoming grayish on lower part of rump; sides paler and grayer; nape rufous, grading into dark chestnut between shoulders; fore feet fulvous; hind feet whitish above, pale fulvous on sides. Tail above dark gray, hairs tipped with buff, beneath white. Ears yellowish brown, blackish on edge at tip, fringe white.

Measurements. Total length, 407; tail vertebræ, 50; hind foot, 92; ear from notch (skin), 55.

h.—caniolumis. (*Lepus*), Miller, Proc. Acad. Nat. Scien. Phil., 1899, p. 388.

Type locality. Fort Clark, Texas.

Geogr. Distr. Southwestern Texas, limits of range unknown.

Genl. Char. Similar to *L. f. chapmani*, Allen, but paler throughout; white of belly not encroached upon by color of the sides.

Color. Like **L. f. subcinctus* Miller, from Hacienda El Molino, Nyrete, Michoacan, Mexico. Back grizzled black and buffy white; rump and tail paler, the terminal band of the under fur *écru* drab. Head paler than back; ears pale gray, tinted with buff inside. Belly pure white.

Measurements. Total length. 395; tail vertebræ, 52; hind foot, 87; ear from crown, 72.

427. auduboni. (*Lepus*), Baird, Mamm., 1857, p. 608, pl. 13, 58.

Type locality. San Francisco, California.

Geogr. Distr. Coast of California from San Francisco to San Diego.

Genl. Char. Size smaller than *L. f. mallurus*; ears longer than head; tail long.

Color. Above pale yellowish brown mixed with black; sides paler with little or no black; nape pale rufous; fore feet, above pale yellowish and rusty; hind feet whitish, sides rusty; pectoral band pale yellowish brown. Under parts white. Ears dark brown, the hairs with pale yellowish tips, so that this hue predominates, grading into black or brownish black at tips. Tail, above like back, beneath black.

Measurements. Total length, 457; tail vertebræ, 38; hind foot, 89; ear from notch, 70.

a.—sanctidiegi. (*Lepus*), Miller, Proc. Acad. Nat. Scien. Phil., 1899, p. 389.

Type locality. Mexican boundary line, San Diego County, California.

Geogr. Distr. Southeastern California.

Genl. Char. Similar to *L. f. auduboni*, but paler.

Color. Above grizzle of black and light cream buff; sides paler; rump whitish gray; nape ochraceous buff; tail, dark brown above, white beneath. Ears gray, lower half paler than crown of head, which is like the back. Orbital ring whitish; chin and throat white tinged with plumbeous; lower part of throat and chest cream buff. Legs ochraceous buff; fore feet cream buff; hind feet white. White

* Proc. Acad. Nat. Scien. Phil., 1899, p. 386.

of belly reaching to wrists and back of hind feet. Belly white, tinged with plumbeous.

Measurements. Total length, 385; tail vertebræ, 63; hind foot, 85; ear from crown, 78.

428. holzerni. (*Lepus*), Mearns, Proc. U. S. Nat. Mus. Wash., 1895, p. 554.

Type locality. Near the summit of Huachuca Mountains, Arizona.

Geogr. Distr. High altitude of mountains in southern Arizona extending into Mexico.

Genl. Char. Size large; ears rather short; hind feet long, colors darkest of this style.

Color. Summer Pelage. Upper sides of head and back vinaceous cinnamon mixed with gray and black; thighs and rump whitish gray lined with black; beneath white tinged with yellowish; pectoral band clay color; nape tawny; legs tawny, inner side brownish white. Ears reddish brown, gray and black mixed, bordered anteriorly for basal two-thirds with white. Tail, above yellowish brown grizzled, beneath white.

Measurements. Total length, 415.2; tail vertebræ, 64; hind foot, 99.5; ear from crown, 77.8; from notch, 65.

429. nuttalli. (*Lepus*), Bachm., Journ. Acad. Nat. Scien. Phil., 1837, p. 345, pl. 22.

artemisia, Bachm., Journ. Acad. Nat. Scien. Phil., 1839, p. 94.

Type locality. Plains of the Columbia near Walla Walla.

Geogr. Distr. Oregon, south through the Sierra Nevada Mountains to Texas and northward to the 49th parallel, or from about the Canadian boundary through the Dakotas to Texas, and west through the Sierra Nevada to Oregon.

Genl. Char. Size small, colors pale.

Color. Above yellowish gray mixed with black and brown; rump light gray and sides of body whitish yellow, nape pale cinnamon; pectoral band light buff; rest of under parts white; fore legs buffy white above; hind legs white. Tail, above like rump, beneath white. Ears pale yellowish brown, edged with white.

Measurements. Total length, 420; hind foot, 500; ear, 50.

430. baileyi. (*Lepus*), Merr., Proc. Biol. Soc. Wash., 1897, p. 148.

Type locality. Spring Creek, east side Bighorn Basin, Wyoming.

Geogr. Distr. Bighorn Basin in Montana across the Owl Creek Mountains into Wind River Basin, and east into northeastern Wyoming. The exact limits of its range are not yet determined.

Genl. Char. Size large; similar to *L. nuttalli*, but paler; ears and tail longer.

Color. Above pale pinkish buff lined sparsely with black; nape pale fulvous; rump grayish lined with black; under parts white; pectoral collar pale buffy fulvous; legs pale fulvous; feet whitish; ears same color as the back, one-fourth of terminal part bordered with black. Tail, above grayish, beneath white.

Measurements. Total length, 418; tail vertebræ, 50; hind foot, 100; ear, 94.

431. grangeri. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 264.

Type locality. Hill City, Custer County, South Dakota.

Geogr. Distr. Mountains of South Dakota, limits of range not known.

Genl. Char. Size medium; ears and feet small; colors dark.

Color. Above dull vinaceous buff, mixed with black and gray, becoming pure gray on rump; sides yellowish gray; beneath white, pectoral band grayish brown. Ears dusky varied with gray.

Measurements. Total length, 353; tail vertebræ, 53; hind foot, 90; ear, 60.

h.—pinetis. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 1894, p. 348.

Type locality. White Mountains, Arizona.

Geogr. Distr. White Mountains, southeastern Arizona, limits of range not known.

Genl. Char. Similar to *L. arizonæ*, but darker in color.

Color. Male in fresh post breeding Pelage. Above black and whitish gray mixed and tinged with pale buff; pectoral band plumbeous, hairs tipped with fulvous gray; fore feet reddish brown; hind feet paler.

Female in breeding Pelage. Above as dark as *L. floridanus*; under fur dark plumbeous at the base, the apical third dark russet brown; over hair dusky, subterminally broadly ringed with whitish and tipped with black, the color of the upper parts extending well on the sides of the abdomen. Feet and ears as in *L. arizonæ*, but darker and much more heavily clothed. Pectoral band very much darker and the fur of the ventral surface much more plumbeous at the base. (Allen, l. c.)

Measurements. Total length, 335; tail vertebræ, 40; hind foot, 100; ear, 69.

432. arizonæ. (*Lepus*), Allen, Rod., 1877, p. 332.

Type locality. Beale's Springs, 50 miles west of Fort Whipple, Arizona.

Geogr. Distr. Deserts of Arizona and in the Chiricahua and Huachuaca, but not the White Mountains, up to 500 feet.

Genl. Char. Smaller than *L. nuttalli*, but similar; ears much longer and broader.

Color. Above pale yellowish gray mixed sparingly with black; nape yellowish fulvous; sides pale gray mixed sometimes with pale brown; chin white, pectoral band yellowish; rest of under parts white; feet pale yellowish brown; tail above yellow brown, darker than back; beneath white. Ears pale grayish brown, outer edge whitish. Winter specimens are heavily lined with black above and on sides.

Measurements. Total length, 340–383; tail vertebræ, 35–54; hind foot, 76–94; ear, 69–78.

a.—major. (*Lepus*), Mearns, Proc. Nat. Mus. Wash., 1895, p. 557.

Type locality. Calabasas, Arizona.

Geogr. Distr. Colorado Plateau of Arizona southward along the Mexican boundary from Paso de Luis, Sonora, to the basin of the Mimbres, Chihuahua.

Genl. Char. “Similar to *L. arizonæ*, but larger, more reddish and darker.”

Color. Above grayish drab tinged with cinnamon, lined with black; sides paler; rump iron gray; nape and outer surface of limbs dull cinnamon; ears pale grayish inside; drab mixed with gray and black on outer side, tips black; pectoral band clay color; rest of under parts white.

Measurements. Total length to end of hairs of tail, 430; tail vertebræ, 42; hind foot, 92; ear from notch, 69.

b.—minor. (*Lepus*), Mearns, Proc. Nat. Mus. Wash., 1895, p. 557.

Type locality. El Paso, Texas.

Geogr. Distr. “Plains of Colorado southward to the Rio Grande, and westward to the elevated central tract, where it integrades with *L. a. major* in the pass between the southern end of the Rocky Mountains, and northern extremity of the Sierra Madre.” (Mearns, l. c.)

Genl. Char. Smaller than *L. arizonæ*; ears short, colors pale; rostrum more elongated, mandible stouter and higher, and audital bullæ larger.

Color. Above yellowish brown lined with black; rump grayish white lined with black; sides yellowish gray, with a buff lateral line; head gray tinged with yellowish brown on cheeks and crown; nape light cinnamon; fore legs wood brown; hind feet above white;



LEPUS (MICROLAGUS) CINERASCENS.
No. 2924 Am Mus. Nat. Hist. N. Y. Coll. Nat. size.

LEPUS (MICROTOLAGUS) MERRIAMI.
No. 8631 Field Columbian Museum Coll. Nat. size.

pectoral band yellowish gray, rest of under parts white; tail above dusky, hairs tipped with yellowish brown and gray, beneath white. Ears grayish white on dorsal surface behind, and gray mixed with yellowish brown and black in front, basal two-thirds of front edge white, tips black.

Measurements. Average total length, 345; tail vertebræ, 50.2; hind foot, 83.4; ear from notch, 65.8.

C. *Brachylagus*.

Brachylagus. Miller, Proc. Biol. Soc. Wash., 1900, p. 157.

Skull short and deep; audital bullae large; rostrum small; supraorbital processes shorter than tooth row, their extremities free; posterior prism of second lower premolar and first and second lower molars less than half as large as anterior; ears, legs and tail short, the latter not perfectly formed. (Miller.)

433. idahoensis. (*Lepus*), Merr., N. Am. Faun., No. 5, 1891, p. 75, fig. 4, p. 77.

Type locality. Pahsimeroi Valley, Idaho.

Geogr. Distr. Sage Plains on Snake River, Idaho, and the northward extensions of these plains. South into northern Nevada and west into eastern Oregon and Washington.

Genl. Char. Size small; ears and hind legs short; tail rudimentary.

Color. Winter Pelage. Above drab gray mixed with black; thighs same color; nape ochraceous buff; sides drab gray; pectoral band grayish buff; belly white; fore and hind feet ochraceous buff. Ears buffy ochraceous mixed with gray and black, bordered in front with a line of black.

Summer Pelage. Drab gray above strongly suffused with buff and mixed with black.

Measurements. Total length, 290; tail, 15; hind foot, 71; ear from notch, 42.

D. *Microlagus*.

"Ear longer than hind foot, tail short; skull narrow, low and lightly ossified, with postorbital process usually free, scarcely touching cranium behind." (Mearns.)

434. cinerascens. (*Lepus*), Allen, Bull. Am. Mus. Nat. Hist., 111, 1890, p. 159.

Type locality. San Fernando, Los Angeles, California.

Geogr. Distr. Deserts of southern California.

Genl. Char. Similar to *L. bachmani*, but smaller and paler.

Color. Above gray and blackish brown mixed; nape pale rusty; dorsal region pale buffy gray, sides pure gray; beneath white; pectoral band brownish gray; fore legs yellowish brown; hind feet grayish brown. Tail, above dark gray, beneath white; ears brownish gray.

Measurements. Total length, 294; tail, 24; hind foot, 63; ear from notch, 58.

E. ^a*Microtolagus*.

Interparietal obliterated in adults, skull twice as long as wide; postorbital processes large, arching and united to cranium by a suture, and enclosing a wide and long foramen; nasals lengthened; upper front incisors without distinct lateral groove. Ears very long.

435. *alleni*. (*Lepus*), Mearns, Bull. Am. Mus. Nat. Hist., 1890, 11, p. 294.

Type locality. Rillito Station, Southern Pacific Railroad, Arizona.

Geogr. Distr. Desert region between Phoenix and Benson, Arizona.

Genl. Char. Size large; ears large; fulvous gular patch.

Color. Above yellowish brown mixed with black; nape fulvous; sides, hips, rump and outside of legs white, mixed with black, giving a gray effect; pectoral band fulvous, rest of under parts white; head pale yellowish gray; feet white above. Tail, above gray with a line of plumbeous black extending on to the rump; beneath white. Ears whitish with fringe white.

Measurements. Total length, 643; tail vertebræ, 69; hind foot, 138; ear from notch, 156.

436. *callotis*. (*Lepus*), Wagl., Syst. Amph., 1830, p. 35.

nigricaudatus, Bennett, Proc. Zool. Soc., 1833, p. 41.

mexicanus, (Licht.), Richards, 6th Rep. Brit. Ass., 1837, p. 150.

flavigularis, Wagl., Supp. Schreib. Säugth., iv, 1844, p. 107.

Type locality. Mexico.

Geogr. Distr. Vicinity of the southern boundary of the United States into Mexico.

Genl. Char. Size large, similar to *L. texensis*, Waterh., but the black on tips of ears almost obsolete, quite so in some specimens, the tips being pale yellowish or white.

Color. Above yellowish brown of greater or less intensity, mixed with black, sides paler; rump and thighs whitish ash lined

with black and with a black line in center of rump; nape black in summer; beneath white; pectoral collar and throat pale brownish yellow; outer surface of fore legs ashy gray lined faintly with black; hind feet white; whitish spot on head. Ear brownish yellow, usually darker toward tip. Tail, above black, beneath brownish gray. Ears, at base black, remainder yellowish, with tip whitish; whiskers black.

Measurements. Total length, 560; tail vertebræ, 57; hind foot, 142; ear, height posteriorly, 137.

437. gaillardi. (*Lepus*), Mearns, Proc. Nat. Mus. Wash., 1895, p. 560.

Type locality. Plagas Valley, near its west fork.

Geogr. Distr. Plain east of the San Luis Mountains, at the head of the Rio Yaqui, and east of that river's watershed. Extent of range unknown.

Genl. Char. Similar to *L. callotis*, but more yellowish, ears smaller; no black patch on nape. Skull: nasals long and very wide; superorbital processes elevated, massive.

Color. Head cream buff and black; whitish area about eye. Nape ochraceous buff. Above pale ochraceous cinnamon mixed with black; rump and thighs white with a few black hairs; sides and under parts white; limbs white washed with buff on outsides; gular patch buff; sides of neck and front of shoulders ochraceous. Ears yellowish brown mixed with black anteriorly; white posteriorly; tip white; fringe on anterior edge ochraceous buff; of tips and posterior edge white. Tail, above black with many white-tipped hairs; beneath white. But little difference between summer and winter pelage.

Measurements. Total length, 530; tail vertebræ, 77; ear from crown, 146; hind foot, 131.

438. merriami. (*Lepus*), Mearns, Proc. Nat. Mus. Wash., 1895, p. 444.

texensis, (*texianus!* *Lepus*), Aud. & Bach., N. Am. Quad., 111, 1853, p. 156, pl. cxxxlll. (nec. Waterhouse.)

Type locality. Fort Clark, Kinney County, Texas.

Geogr. Distr. "Lower Gulf coast to mouth of Rio Grande and up that stream to mouth of the Devil's River."

Genl. Char. Similar to *L. callotis*; ears shorter and tipped with black.

Color. Above grayish fawn mixed with black; nape black; sides of rump, thighs and legs grayish white lined with black; a black line

on middle of rump; gular area clay color; rest of under parts white except a cream buff patch on sides of abdomen, such as are usually seen before the thighs. Tail, above black, beneath white. Ears on anterior surface yellowish brown mixed with black, the border buff succeeded by a narrow black line, inner surface with base and tip black, intermediate space grayish white; inside ears buff with an elongated black patch near outer edge; the border is white at base, then buff, and black at tip.

Measurements. Total length, 570; tail vertebræ, 75; hind foot, 123; ear from crown, 142.

439. melanotis. (*Lepus*), Mearns, Bull. Am. Mus. Nat. Hist., 1890, 11, p. 297.

Type locality. Independence, Kansas.

Geogr. Distr. Kansas, Indian and Oklahoma Territories, and western Texas.

Genl. Char. General color above bright fulvous, no gray nor ashy, head brownish yellow. Size large.

Color. Above bright fulvous mixed or blotched with black, lower part of throat and pectoral band dark fulvous; sides of rump and thighs yellowish white, sometimes lined with black. Tail, above black, this color extending in a narrow line a short distance on the rump; ears anteriorly brown and black mixed; a narrow black line inside fringe, which is pale fulvous; posterior border white to the tip, which is black; inner surface white, tip black.

Measurements. Total length, 590; tail vertebræ, 77; hind foot, 130; ear from crown, 142.

440. texensis. (*texianus!* *Lepus*), Waterh. (nec Aud. & Bachm.), Nat. Hist. Mamm., 11, 1848, p. 136.

Type locality. Texas? actual locality unknown.

Geogr. Distr. Southeastern Oregon to Mexico, and from Sierra Nevada Mountains to eastern border of plains east of Rocky Mountains?

Genl. Char. Size large, color fulvous, not grayish or ashy.

Color. Head brownish yellow; above bright fulvous mixed with black; sides of rump and thighs white lined with black; shoulders and pectoral band deep fulvous, under parts white; ear fringed anteriorly with bright fulvous. Tail, above black, beneath grayish; whiskers white.

Measurements. Total length, 590; tail vertebræ, 77; hind foot, 130; ear from crown, 142.

a.—eremicus. (*Lepus*), Allen, Bull. Amer. Mus. Nat. Hist., 1894, p. 347.

Type locality. Fairbank, Arizona.

Geogr. Distr. White Mountain region, southeastern Arizona.

Genl. Char. "Similar to *L. texianus!* (*texensis*), as restricted by Dr. Mearns, but much smaller."

Color. "No very obvious difference in coloration!" (Allen, l. c.)

Measurements. Total length, 565; tail vertebræ, 74; hind foot, 123; ear from crown, 128.

b.—griseus. (*Lepus*), Mearns, Proc. Nat. Mus. Wash., 1895, p. 562.

Type locality. Fort Hancock, El Paso, Texas.

Geogr. Distr. Upper Rio Grande from Maverick and Kinney Counties, Texas to Grant County, New Mexico, and south into Mexico.

Genl. Char. Size about equal to *L. californicus*, ear larger.

Color. Winter Pelage. Above brownish gray lined with black; rump and thighs gray; sides gray lined sparsely with black and tinged with yellowish brown; nape grayish white. Top of head brownish gray mixed with black; sides of head and neck tinged with yellowish brown; gular patch grayish clay color; rest of under parts white; legs gray tinged with clay color. Tail, above black, this color extending over and dividing the gray on the rump; beneath brownish; ears brownish gray on outside anteriorly, with brownish white fringes; posteriorly white tipped with black and fringed with white.

Measurements. Total length, 559.2; tail vertebræ, 91.5; hind foot, 127; ear from crown, 152.8.

c.—deserticolus. (*Lepus*), Mearns, Proc. Nat. Mus. Wash., 1895, p. 564.

Type locality. Western edge of the Colorado Desert, at base of Coast Range Mountains in San Diego County, California.

Geogr. Distr. Desert region between the Sonoyta Valley of Arizona and Sonora, and the Coast Range Mountains of California, and Lower California.

Genl. Char. Size of *L. californicus*, with large ears, colors pale.

Color. Above clay color mixed with gray and black, sides and gular patch ochraceous; beneath tinged with ochraceous buff; ear pale drab and white as usually seen, tipped with black on under side.

Measurements. Total length, 560; tail vertebræ, 110; hind foot, 125; ear from crown, 158.

441. californicus. (*Lepus*), Bachm., Journ. Acad. Phil., 1839, p. 86.

bennettii, Gray, Zool. Sulphur, 1844, p. 36, pl. 14.

richardsoni, Bachm., Journ. Acad. Nat. Scien. Phil., 1839, p. 88.

Type locality. San Diego, California.

Geogr. Distr. From northern California along the coast to Cape St. Lucas.

Genl. Char. Size large; ears and hind feet longer than the head; hind feet shorter than ears.

Color. Above yellowish brown mixed with black; sides, rump and thighs tinged with cinnamon; head like back, darkest on the crown; nape smoky gray beneath; white in center of belly and chin; chest pale yellowish brown, as are also the fore legs; hind feet whitish; tail above black, this color extending on to the rump and dividing the gray sides; beneath pale buff; ears dark brown fringed anteriorly with white and with a fulvous white border posteriorly, tips brownish black.

Measurements. Total length, 545; tail vertebræ, 107; hind foot, 161; ear from notch, 125.



FELIS CONCOLOR.

No. 23 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.

Order VII. **Carnivora.**

Fam. I. **Felidae.**

D. G. Elliot. *Monograph of the Felidæ, Folio, London, 1878-83.*

St. G. Mivart. *The Cat., London, 1881.*

Claws retractile, long, sharp, curved, compressed; feet digitigrade, five toes on fore feet, four on hind; soles hairy; pads naked; tongue covered with sharp, horny-like papillæ pointing backward; only one true molar on each side above and below, and two inferior premolars; upper carnassial, (posterior premolar), very large, with a tri-lobed blade and a small inner tubercle with separate root; lower carnassial, (true molar), a large, compressed sharp blade with two subequal lobes, without inner cusp; canines long, curved, acute, edges trenchant. Skull short, broad, facial portion short; zygomata very wide, arched; bullæ large, smooth. Clavicles not articulating with scapulæ or sternum.

70. **Felis.**

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{2-2}; M. \frac{1-1}{1-1} = 30.$$

Felis. Linn. Syst., 1766, 1, p. 60. Type *F. leo*.

Lynx. Raf. Am. Month. Mag., 1817, 1, p. 437.

Lynchus. Gray, Proc. Zool. Soc., 1867, p. 276.

Tail long, exceeding half the length of body without head and neck; anterior premolar small.

442. concolor. (*Felis*), Linn., Mantiss., 1771, p. 522.

discolor, Schreb. Säugth., 1778, 111, tab. 104 B.

puma, Shaw, Gen. Zool., 1830, p. 358, pl. cxxxix.

floridana, Cory, Hunt & Fish. Florida, 1896, p. 109.

coryi, Bangs, Proc. Biol. Soc. Wash., 1899, p. 15.

Type locality. Brazil.

Geogr. Distr. Canada from 50° north to Gulf of Mexico, and westward to Wyoming, probably to the Pacific coast.

Genl. Char. Size large; body long, legs short; tail more than half the length of body and head; young spotted.

Color. Variable, upper parts from yellowish to reddish brown;

beneath dirty white; black patch on upper lip bordered by a white space; back of ear black; tip of tail dusky.

Measurements. Total length about 2236; tail vertebræ, 815.

?a.—oregonensis. (*Felis!*), Rafin. Atlantic Journ., 1832, 1, No. 2, p. 62.

hippolestes, (*Felis*), Merr. Proc. Biol. Soc. Wash., 1897, p. 219.

olympus, Merr. Proc. Biol. Soc. Wash., 1897, p. 220.

Type locality. Northwest coast, east to Rocky Mountains.

Geogr. Distr. Not entirely ascertained.

Genl. Char. Size large, skull and teeth large, but probably varying very considerably in size.

Color. Upper parts and sides rufous brown, varying in depths and shade, deepest on back and tail; tip of tail black; under parts dull white.

Measurements. Total length, about 2100; tail vertebræ, 800; hind foot, 260. Skull: basal length, 160; zygomatic breadth, 130; palatal length, 76.

A. Leopardus.

Tail long, about length of body. Posterior portion of premaxilla very narrow and lengthened.

443. onca. (*Felis*), Linn. Syst. Nat. 1766, p. 61.

mexicana, Hernand. Thes. Rer. Med. Nov. Hisp., p. 498.

hernandezi, Gray, P. Z. S., 1857, p. 278, pl. xviii.

Type locality. Not determinable. "America meridionali."

Geogr. Distr. Red River of Louisiana, southward.

Genl. Char. Larger and heavier than puma; tail less than half the length of head and body; body spotted.

Color. Variable. Usually above brownish yellow, beneath white spotted with black. Shoulders, neck and head covered with small black spots; which on the body, sometimes confluent, form large rosettes with one or more spots in the center, and ranged in from five to seven rows lengthwise. Black spot at opening of mouth; tail ringed with black; lips, throat, under parts and under side of tail, white. Ear behind, black, buff spot near tip.

Measurements. Total length, 1900-2500; tail about 600.

444. pardalis. (*Felis*), Linn. Syst. Nat., 1, 1766, p. 62.

Type locality. Mexico.

Geogr. Distr. Texas, from Red River, southward to Buenos Ayres, east of the Andes.

Genl. Char. Size less than the lynx; tail less than half length of head and body. Color markings very irregular.

Color. Very variable. Typical style with upper parts rufous,

marked with black lines and spots, some of the latter with rufous centers. Flanks and loins yellowish white, striped with rufous, margined with black; legs spotted with black on light buff; feet buffy white; cheeks covered by two black lines; chin, throat, breast and belly white, the last two spotted with black; tail dark buff, banded and spotted with black, tip blackish.

Measurements. Total length, about 970; tail vertebræ, 347.

445. jaguarondi. (*Felis*), Fisch. Zoogn., 1814, p. 228.

Geogr. Distr. Rio Grande, Texas, southward to Paraguay east of Andes.

Genl. Char. Body elongated; legs short; tail as long as body without head.

Color. General color grizzled brownish gray, hairs annulated and black tipped. Tail like body. Some specimens black with rufous tinge, tips of hairs white.

Measurements. Total length, 678; tail vertebræ, 365.

446. eyra. (*Felis*), Fisch. Zoogn., 1814, p. 228.

Geogr. Distr. Brownsville, Texas, south to Paraguay east of the Andes.

Genl. Char. Body long and slender; legs short, tail very long.

Color. Rich brownish red; darkest on the back, lightest on belly. Tail same color.

Measurements. Total length, 670; tail vertebræ, 230.

*B. *Lynx*.

Tail short, less than half the length of body without head; anterior premolar wanting.

447. canadensis. (*Felis*), Desm. Mamm., 1820, p. 224.

Type locality. Canada.

Geogr. Distr. Boreal America, latitude of Maine to 60° north latitude and from Atlantic to Pacific Oceans, possibly only south of Alaska.

Genl. Char. Body stout, legs very long; feet very large; fur dense and very long.

Color. Light gray, base of hairs rufous, giving a reddish tinge to the coat; top of head and back darkest. Ears behind black with a gray patch, and with tufts of black hairs projecting upwards from the tips; under parts white.

Measurements. Total length, 766; tail vertebræ, 129.

a.—mollipilosus. (*Lynx*), Stone, Proc. Acad. Nat. Scien. Phil., 1900, p. 48.

*Several of the varieties in this subgenus hold a very questionable, distinctive rank.

Type locality. Wainwright Inlet, Point Barrow, Alaska.

Geogr. Distr. Northwestern America south to British Columbia.

Genl. Char. Similar to *F. (L.) canadensis*, but browner and less gray. "Skull narrower, higher and more arched than *L. canadensis*, and much more constricted across the frontals and between the orbits; the postorbital processes are conspicuously more slender."

Color. "Browner and less gray than true (*Lynx*) *canadensis*, with a very dense, soft, wooly pelage."

Measurements. "Total length, 1040; tail vertebræ, 130; hind foot, 260." (Stone l. c.)

b.—*subsolanus*. (*Lynx*), Bangs, Proc. Biol. Soc. Wash., 1897, p. 49.

Type locality. Codroy, Newfoundland.

Geogr. Distr. Newfoundland.

Genl. Char. Size of *F. canadensis*, but darker.

Color. Upper parts black and hazel mixed; legs and arms dull yellowish hazel faintly spotted with darker; tail dull hazel above, dirty white beneath, tip black; belly wood brown spotted with black, long hairs dirty white.

Measurements. Type. Total length, 919; tail vertebræ, 109; hind foot, 219; ear from notch, 80.

448. *rufa*. (*Felis*), Guldenst., Nov. Comm. Acad. Petrop., 1776, xx, p. 499.

Type locality. New York.

Geogr. Distr. Central North America from southern Georgia to Maine.

Genl. Char. Body moderately stout, tail short, legs long; fur soft, full.

Color. Yellowish brown spotted on sides with dark brown. Brown stripe on forehead and one on back and tail. Under parts yellowish white spotted with black. Legs yellowish brown spotted with black on outside, dull white on inner barred with black; chin and throat whitish; breast white barred with black. Two black bars across cheek.

Measurements. Total length, 750; tail vertebræ, 107.

a.—*maculata*. (*Felis*), Vig. & Horsf. Zool. Journ., 1829, iv, p. 381, pl. 13.

Type locality. Mexico?

Geogr. Distr. Texas to California.

Genl. Char. Fur coarse; distinct spots on back and sides.

Color. Above chestnut brown, darkest on back, with rather indistinct spots, also on outer side of legs; under parts white with

large black spots. Inside of thighs banded with black and chestnut. Tail beneath white, tip above black.

Measurements. Total length, about 900; tail vertebræ, 126.

b.—fasciata. (*Lynx*), Rafin. Am. Month. Mag., 11, 1817, p. 46.

Type locality. Borders of plains and woods of the Columbian River.

Geogr. Distr. Oregon and Washington.

Genl. Char. Fur very full and soft, color reddish.

Color. Rich chestnut brown above, pale on sides and throat; belly white spotted with black. Terminal third of tail black.

Measurements. Total length, 890; tail vertebræ, 139; hind foot, 129. (Skin.)

c.—pallescens. (*Lynx*), Merr., N. Am. Faun., No. 16, 1899, p. 104.

Type locality. Trout Lake, base of Mount Adams, Washington.

Geogr. Distr. Region about Shasta Mountain, California, Oregon? and Washington.

Genl. Char. Similar to *F. r. fasciata*, but smaller and paler.

Color. General color hoary gray, paler than *F. r. fasciata*, gray ear patch larger.

d.—oculeus. (*Lynx*), Bangs, Proc. N. Eng. Zool. Soc., 1899, p. 23.

Type locality. Nicasio, Marin County, California.

Geogr. Distr. Coast region of California, north of San Francisco Bay.

Genl. Char. Back dusky; ferruginous color lacking.

Color. Upper parts, hairs ringed with black and grayish brown, often black tipped; back darker without stripes or spots; sides gray, ochraceous buff of under fur showing through. Top of head and face grizzled gray lined and spotted with black; arms grayish brown above spotted with brownish black, below white banded with black; legs grayish brown on inside, spotted and banded with black. Tail, rusty brown above barred with black, beneath and at tip white. Under parts white, lower sides pale cinnamon spotted and barred with black; collar of ochraceous buff on under side of neck barred with black.

Measurements. "Type. Total length, 778; tail vertebræ, 139.7; hind foot, 158.75; ear, 72.8."

e.—baileyi. (*Lynx*), Merr., N. Am. Faun., No. 3, 1890, p. 79.

Type locality. Moccasin Spring, Arizona.

Geogr. Distr. Arizona, limits of range unknown.

Genl. Char. Similar to *F. rufa*, but paler above and having a shorter tail!

Color. Upper parts suffused with a buffy tint, dark markings not extensive. No black on face and forehead, black tip of tail very narrow.

Measurements. Total length, 745; tail vertebræ, 132; hind foot, 165.

f.—eremica. (*Lynx*), Mearns, Proc. U. S. Nat. Mus., 1897, xx, p. 457.

Type locality. Laguna Station, Colorado Desert, San Diego County, California.

Geogr. Distr. Eastern and western desert tracts on the Mexican line.

Color. Above grizzled pale yellowish brown, spotted and striped with brown and black; legs ochraceous buff mixed with grayish; under parts white and with inside of limbs spotted or banded with black. Flanks and outside of limbs spotted with yellowish brown. Tail, reddish brown above, white below, subterminal spot of black, rest barred with black; ears as usual.

Measurements. Total length, 925; tail vertebræ, 170; hind foot, 185.

g.—californica. (*Lynx*), Mearns, U. S. Nat. Mus., 1897, xx, p. 458.

Type locality. San Diego, California.

Geogr. Distr. Pacific coast tract of California, and Lower California.

Color. Above reddish brown mixed with gray and black, and two interrupted black lines from shoulder to root of tail. Outer sides of limbs and sides ochraceous buff mixed with gray and spotted with yellowish brown. Inner surface of limbs, under surface of head and body, and under side of tail white, banded or spotted with black. Chest with a rusty gray collar spotted with black.

Measurements. Total length, 752; tail vertebræ, 150.

h.—texensis. (*Lynx*), Allen, Bull. Am. Mus. Nat. Hist., 1895, p. 188.

rufus var. *maculatus*, Kerr, Linn. Syst. Nat., 1792, 1, pt. 1, No. 297 (nec Vig. & Horsf.).

rufus var. *maculatus*, Aud. & Bach., N. Am. Quad., 11, 1851, p. 293, pl. xcII (nec Vig. & Horsf.).

Type locality. Texas.

Geogr. Distr. Texas, and New Mexico to southern California.

Color. Above chestnut brown, darkest on dorsal region, spotted and sprinkled with black; the spots largest and most distinct on limbs and flanks. Under parts white with large black spots. Inside



CANIS LATRANS.

No. 370 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.

of legs banded with black. Tail, above rusty gray or brown, tip black, beneath white. Ears black with a central gray spot.

Measurements. Total length, 824; tail vertebræ, 115.

i.—floridana. (*Lynx*), Rafin., Am. Month. Mag., 11, 1817, p. 46.

Type locality. Florida.

Geogr. Distr. Florida to Louisiana, Gulf coast.

Genl. Char. Slender, feet small, darker in color than *F. rufa*, spotted.

Color. Above and on sides gray without rufous tinge, spotted and lined on body and head distinctly with black; dorsal surface mixed with black. Tail, with half rings above and tip black, beneath white; under parts white spotted with black.

Measurements. Total length, about 890; tail, 175.

449. gigas. (*Lynx*), Bangs, Proc. Biol. Soc. Wash., 1897, p. 50.

Type locality. Bear River, Nova Scotia.

Geogr. Distr. Nova Scotia, limits of range unknown.

Genl. Char. Large, upper parts blackish.

Color. Upper parts cinnamon and black, latter color most prominent on back; tail above cinnamon mixed with black, beneath white, tip black; under parts dull white spotted with black; pectoral collar cinnamon; feet beneath black.

Measurements. Type. Total length, 1,001; tail vertebræ, 177; hind foot, 200.

Fam. II. Canidae.

St. George Mivart, *Monograph of the Canidae*, 1890.

C. H. Merriam, *Review of the Coyotes*, Proc. Biol. Soc. Wash., 1897, p. 19.

Claws not retractile; feet digitigrade; four toes on hind foot, five on fore foot, one rudimentary situated high above the others, sometimes absent. Bullæ inflated; paroccipital process in contact with bullæ.

Sub. Fam. I. Caninae.

71. Canis.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{2-2}{3-3} = 42.$$

Canis. Linn. Syst. Nat., 1766, 1, p. 56. Type *C. lupus*.

Nose long, tapering; jaws elongated; postorbital processes of the frontals short; orbit open posteriorly; brain case lengthened, compressed anteriorly; claws short, blunt, slightly curved. Upper carnassial with a strong blade, the middle lobe conical, pointing backwards, the anterior lobe nearly obsolete; lower carnassial with a

bilobed blade, compressed, the hinder lobe the larger, with two cusps and a raised interior border.

450. occidentalis. (*Canis*), Rich. Faun. Bor. Am., 1829, p. 60.

griseis, Rich. Faun. Bor. Amer., 1829, p. 66.

ater, Rich., Faun. Bor. Amer., 1829, p. 115.

occidentalis var. rufus, Aud. & Bach. N. A. Quad., 1851, 11, p. 240, pl. lxxxll.

Type locality. Not given. Plains of Saskatchewan?

Geogr. Distr. Western North America to Nebraska and Idaho, south to Mexico, north to Greenland; rare in United States east of the Mississippi.

Genl. Char. Size very large, color usually light, white to grizzled gray.

Color. The color of this species varies greatly from all white through different degrees of gray to all black; majority gray and white tinged with brown. Doubtfully distinct from *C. lupus* of the Old World.

Measurements. Total length, 1,449; tail vertebræ, 399.

451. nubillus. (*Canis*), Say, Long's Exped. Rocky Mts., 1823, 1, p. 169.

Type locality. Prairie near Council Bluffs, Iowa.

Geogr. Distr. Great Slave Lake to longitude of Idaho, south to Nebraska and to California?

Genl. Char. Size large, color sooty or plumbeous brown.

Color. Say's description of type. "Dusky color, the hair cinereous at the base, then brownish black, then gray, then black; the gray of the hairs combining with the black tip to produce a mottled appearance; the gray predominating on the sides. Ears short, deep brownish-black, with a patch of gray hair within. The under parts dusky ferruginous, grayish with long hairs between the thighs and with a large white spot on the breast, the ferruginous color very much narrowed on the neck, but dilated on the lower part of the cheeks; legs brownish black with a slight admixture of gray hairs, excepting on the anterior edge of the hind thighs; and the lower edgings of the toes, where the gray predominated; the tail was short, fusiform, a little tinged with ferruginous, black above, near the base, and at the tip; the top of the trunk hardly attaining the os calcis; the longer hairs of the back, particularly over the shoulders, resembled a short, sparse mane." The specimen figured by Richardson, Faun. Bor. Am., 1829, p. 69, pl. 3, Mamm., was killed at Fort Resolution, Great Slave Lake, Lat. 61.

Measurements. Total length, about 1,365; tail vertebræ, 273.

- 452. latrans.** (*Canis*), Say, Long's Exped. Rocky Mts., 1, 1823, p. 168.

Type locality. Council Bluffs, Iowa.

Geogr. Distr. Northern valley of the Mississippi, westwards on northern edge of plains to Rocky Mountains in Alberta Province.

Genl. Char. Size large, color pale; premolar and carnassial teeth very large and greatly swollen.

Color. Muzzle pale fulvous sprinkled with gray and black; top of head grizzled gray; ears deep fulvous, sprinkled with black; upper parts buffy gray and black; under parts and upper lip whitish; throat hairs tipped with blackish; color grizzled, fore legs and feet dirty white, clay color on outer side; hind legs and feet fulvous on outer side, white on inner and on top of feet; tail tipped with black; underneath white basally, pale fulvous on distal half, tipped and edged with black.

Measurements. Total length, 1,219; tail vertebræ, 394; hind foot, 179.

- 453. nebracensis.** (*Canis*), Merr., Science, 1898, p. 782.

pallidus, Merr., Proc. Biol. Soc. Wash., 1897, p. 24 (preoccupied).

Type locality. Johnstown, Brown County, Nebraska.

Geogr. Distr. Great Plains, eastern Colorado to Canada.

Genl. Char. Like *C. latrans*, but paler; skull and teeth smaller.

Color. Muzzle ochraceous buff; top of head grizzled grayish tinged with buff; ears buff; upper parts buffy white, mixed with black; under parts white; no distinct collar; fore and hind legs and feet soiled white tinged with buff on outer side of fore, and pale fulvous on hind, legs; tail pale, under side white basally, then buff and tipped with black.

Measurements. Smaller than *C. latrans*, hind foot, (not in flesh), 77. Basal length of skull, 177; of Hensel, 173; zygomatic breadth, 100; palatal length, 93; mastoid breadth, 63.5; length of crown of upper carnassial tooth, 21.

- 454. lestes.** (*Canis*), Merr. Proc. Biol. Soc. Wash., 1897, p. 25.

Type locality. Togabe Mountains near Cloverdale, Nevada.

Geogr. Distr. Southern British Columbia through Washington and Oregon to the plateau of northern Arizona and New Mexico, and to Mexican boundary.

Genl. Char. Size medium; ears and tail large; color similar to *C. latrans*; skull and teeth medium.

Color. Muzzle pale cinnamon rufous; top of head grizzled gray and ochraceous, crown, nape and ears fulvous; rest of upper parts grayish buffy mixed with black; under parts whitish tinged with buff

on belly; ruff tipped with black; fore and hind legs buffy ochraceous on outer side, whitish on inner, and on hind feet; tail broadly tipped with black; white beneath on basal third, ochraceous on remainder, the hairs tipped with black towards the black tip.

Measurements. Total length, 1116; tail vertebræ, 320; hind foot, 200.

455. frustror. (*Canis*), Woodh. Proc. Acad. Nat. Scien. Phil., 1851, p. 147.

Type locality. Port Gibson, Neosho and Arkansas Rivers, Indian Territory.

Geogr. Distr. Gulf region of Texas from Nueces Bay northward, and possibly through the States into Oklahoma and Indian Territories.

Genl. Char. Larger than *C. peninsulae* of Lower California, colors paler, ears shorter, rostrum longer.

Color. Muzzle cinnamon rufous; top of head, nape and ears pale fulvous; rest of upper parts buffy ochraceous mixed with black; under parts whitish tinged with buff on belly; ruff tipped with black; fore and hind legs and feet fulvous all round; upper surface of fore legs and feet mixed with black, forming a stripe; outer face of thighs sprinkled with black half way to heel; tail above fulvous, white basally, hairs of distal half tipped with black.

Measurements. Total length, 1190; tail vertebræ, 330; hind foot, 200.

456. mearnsi. (*Canis*), Merr. Proc. Biol. Soc. Wash., 1897, p. 30.

Type locality. Quitobaquita, Pima County, Arizona.

Geogr. Distr. Southern Arizona into Sonora.

Genl. Char. Size small; color bright; skull and teeth small.

Color. Forehead grizzled gray and fulvous; top of head, nape and ears light fulvous; muzzle cinnamon rufous; rest of upper parts buffy ochraceous mixed with black; under parts white, belly tinged with buffy ochraceous; throat buffy, hairs tipped with black; fore and hind legs and feet bright orange fulvous all round; upper sides of fore legs with black mixture; tail beneath pale fulvous, whitish at base, remainder with black tipped hairs; tip black.

Measurements. Total length, 1100; tail vertebræ, 330; hind foot, 180.

457. estor. (*Canis*), Merr. Proc. Biol. Soc. Wash., 1897, p. 31.

Type locality. Noland's Ranch, San Juan River, Utah.

Geogr. Distr. Deserts of eastern California, Nevada and Utah.

Genl. Char. Size small, color pale; carnassial and molar teeth small.



VULPES PENNSYLVANICA.

No. 100 Field Columbian Museum Coll. | nat. size.

Color. Muzzle pale fulvous, top of head gray and buff; ears and nape ochraceous buff; upper parts buffy mixed with black; under parts whitish; ruff conspicuously black tipped; outer side of fore legs bright buff, pale on inner side, and on fore feet; outer side of hind legs and feet buffy ochraceous; inner side of hind leg and upper surface of hind foot white; under side of tail ochraceous, white basally, hairs of distal half tipped with black; tip of tail black.

Measurements. Total length, 1052; tail vertebræ, 300; hind foot, 179.

458. ochropus. (*Canis*), Eschsch. Zool., Atlas, 111, 1829, pp. 1-2, pl. 11.

Type locality. California.

Geogr. Distr. San Joaquin Valley, California.

Genl. Char. Similar to *C. latrans*, but smaller, darker; and more highly colored; ears larger; skull and teeth smaller.

Color. Muzzle grizzled cinnamon rufous; top of head grayish fulvous, rest of upper parts buffy ochraceous mixed with black; under parts whitish, belly tinged with buff; grizzled hairs of ruff tipped with black, sometimes going on to breast as in *C. estor* and *C. mearnsi*; fore and hind legs and feet fulvous all round, paler on inner side, and very deep on outer side of hind leg; upper side of fore leg strongly marked with black; outer side of thighs with black tipped hairs; tail beneath pale fulvous, white basally, tipped and edged with black; terminal third of under side hairs black tipped; extreme tip often white.

Measurements. Total length, 1110; tail vertebræ, 295; hind foot, 180.*

72. Vulpes.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{2-2}{3-3} = 42.$$

Vulpes, Briss., Reg. Anim., 1758, p. 239.

Leucocyon, Gray, Proc. Zool. Soc., 1868, p. 521.

Body rather short; legs short; tail long, bushy, more than half the length of body, fur soft, hair long; muzzle elongated, tapering; ears moderate, erect; nasals not extending back to maxillaries; postorbital processes above concave; temporal crests nearly in contact.

A. Vulpes.

459. harrimani. (*Vulpes*), Merr., Proc. Wash. Acad. Scien., 1900, p. 14.

Type locality. Kadiak Island, Alaska.

* It is difficult to distinguish these varieties of the Coyote by any description, and still more so by the skins or skulls.

462. velox. (*Canis*), Say, in Long's Exped. Rocky Mts., 1, 1823, p. 487.

cinereo-argentatus, Sabine, (nec Erxleb.) Frank Journ., p. 658.

microtus, Reich. Reg. Anim., p. 10, figs. 72 and 73.

Type locality. Nebraska.

Geogr. Distr. Colorado and Nebraska north to the plains of the Saskatchewan, Assiniboia.

Genl. Char. Size small, head short, broad; legs short; tail half as long as the body and head.

Color. Top of head, ears, upper part of body and tail yellowish gray, darkest on back, hairs tipped with white; sides of neck, flanks and upper portion of legs buffy white, inclining to rufous where it meets the gray of upper parts. A black patch on each side of muzzle, some hairs white tipped. Under part and legs white; under part of tail buff, tip black.

Measurements. Total length, 645; tail vertebræ, 226; hind foot, 95.

463. macrotis. (*Vulpes*), Merr., Proc. Biol. Soc. Wash., 1888, iv, p. 135.

Type locality. Riverside County, southern California.

Geogr. Distr. Southern California south to Mexico.

Genl. Char. Size small; ears long, broad; muzzle, legs and tail long and slender; tail longer than body. Soles of feet haired.

Color. Upper parts grizzled gray, palest on head, darkest on back; sides, upper surface of legs and pectoral band pale fulvous. Under parts white mixed with pale ochraceous buff.

Measurements. Total length, 850; head and body, 510; tail vertebræ, 290; to end of hairs, 340; hind foot, 110; height of ear to crown, 68. Skull occipito-nasal length, 103; zygomatic breadth, 58.2; inter-orbital constriction, 19.8; palatal length, 55.7; mandible, 83.8; (Merriam l. c.)

464. lagopus. (*Canis*), Linn. Syst. Nat., 1, 1766, p. 59.

Type locality. Lapland?

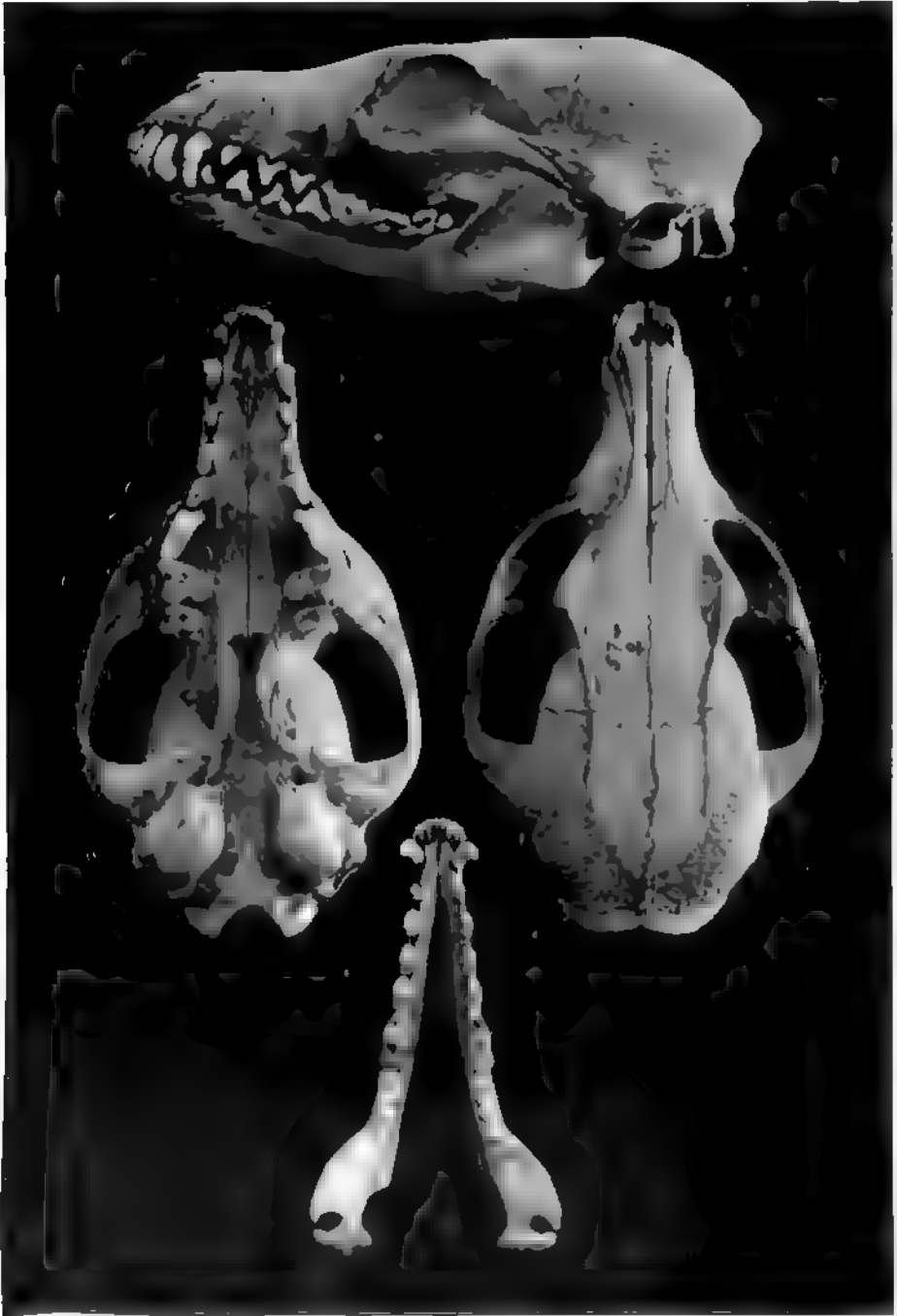
Geogr. Distr. Polar regions of both hemispheres from 50° north latitude to Arctic Sea.

Genl. Char. Size small; tail thick, bushy; pelage changing to white in winter.

Color. Summer Pelage. Head and upper parts, flanks and outside of legs, brown; under parts and inside of legs dingy white; tail brownish above, white beneath, tip white.

Winter Pelage. Pure white.

Measurements. Total length, 787; tail vertebræ, 262; heel to end of claw, 115.



UROCYON CINEREO-ARGENTEUS SCOTTII.

No. 574 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.

465. hallensis. (*Vulpes*), Merr., Proc. Wash. Acad. Scien., 1900, p. 15.

Type locality. Hall Island, Bering Sea.

Genl. Char. Similar to *V. lagopus*. Skull broader and shorter; bullæ large.

Color. Head sooty mixed with white between eyes and on sides; upper parts and legs sooty brown; sides and under parts buffy; chin and upper part of throat dusky gray; ears dusky edged with buffy white; nose whitish; hind feet dusky grizzled with white. Tail dusky above at base, yellowish buff distally; beneath yellowish white.

Measurements. Total length, 825; tail vertebræ, 290; hind foot, 140.

72. Urocyon.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{2-2}{3-3} = 42.$$

Urocyon. Baird, Mamm. N. Am., 1857, p. 121. Type *Canis virginianus*, Erxleb.

“Tail with a concealed mane of stiff hairs, without any soft fur intermixed; muzzle short; temporal crests widely separated. Upper incisors scarcely lobed; postorbital processes bent but little downwards, the anterior edge turned up; a longitudinal shallow pit at its base. Supplementary tubercle on the lower sectorial. The under jaw with an angular emargination below.” (Baird, l. c.)

466. cinereo-argenteus. (*Canis*), Müll. Natur. Suppl., 1776, p. 29. *virginianus*, Schreb. Säugth., 1778, 111, pl. 92 B.

griseus, Bodd. Elench. Anim., 1784, 1, p. 37.

Type locality. Unknown. North America.

Geogr. Distr. Eastern North America from Georgia north to New England, west to Mississippi Valley.

Genl. Char. Size large; tail more than half the length of head and body, bushy.

Color. Entire upper parts silver gray, extending over outer side of fore legs; base of ears, patch at side of neck, collar on throat, interior surface of fore legs, and a broad band along belly cinnamon rufous. Rest of under parts, inside of thighs, and a line down hind legs grayish white. Chin and patch on nose near muzzle, black. Tail above silver gray, central portion and tip black, beneath light chestnut.

Measurements. Total length, 930; tail vertebræ, 317; hind foot, 135.

a.—floridanus. (*Urocyon*), Rhoads, Proc. Acad. Nat. Scien., Phil., 1895, p. 42.

Type locality. Tarpon Springs, Florida.

Geogr. Distr. Florida generally, north into Georgia where it intergrades with *U. cinereo-argenteus*.

Genl. Char. Size small; hind foot, tail and ears shorter, pelage harsher than in *U. cinereo-argenteus*.

Color. Top of head, upper parts and upper surface of legs and feet silver gray; chin, whisker patch, double line from nose to cheeks, line on upper part and tip of tail, black; sides of neck, band on throat, and under surface of fore leg rusty brown; throat and stripe on cheek white; rest of under parts rusty fulvous. Soles of feet cinnamon.

Measurements. Type. Total length, 900; hind foot, 125; tail vertebræ, 260; ear from crown, 60. (Dry skin.) (Rhoads.)

b.—scotti. (*Urocyon*), Mearns, Bull. Am. Mus. Nat. Hist., 1891, p. 236.

Type locality. Pinal County, Arizona.

Geogr. Distr. Southern California, Arizona and western New Mexico.

Genl. Char. Similar in size and color to *U. cinereo-argenteus*. Longer ears and tail, muzzle more attenuated, colors paler.

Color. Hoary, gray, sometimes a median black line from head to base of tail; sides paler. Lower jaw and sides of muzzle black except white spot near tip; lower sides of cheeks, throat, patch on breast, and one on belly white, sides of neck, hinder surface of legs yellowish fulvous; anterior of fore legs hoary; chest and inner sides of legs fulvous; tail gray with a narrow black stripe above, and beneath yellowish fulvous.

Measurements. Total length, 985; tail vertebræ, 405; hind leg from knee joint, 240.

c.—texensis. (*Urocyon*), Mearns, Proc. Nat. Mus. Wash., 1897, p. 459.

Type locality. San Pedro, Eagle Pass, Texas.

Geogr. Distr. Texas.

Genl. Char. Similar to *U. cinereo-argenteus*, but paler; ears larger; tail longer.

Color. Markings of the limbs, sides of neck and base of ears, which are chestnut or cinnamon rufous in the typical form, are ochraceous. (Mearns, l. c.)

Measurements. Height of ear above crown, 80; hind foot, 128; tail vertebræ, 350.

d.—californicus. (*Urocyon*), Mearns, Proc. Nat. Mus., Wash., 1897, p. 459.

Type locality. San Jacinto Mountains, Riverside County, California.

Geogr. Distr. California to Washington.

Genl. Char. Similar to *U. c. texensis*, with longer ears and grayer, less fulvous coloring.

Color Like *U. cinereo-argenteus*, with the color of the back about the same, but the coloration as a whole is paler; and the California animals lack the black down the fore legs.

Measurements. Total length, 890; tail vertebræ, 330; hind foot, 120. (Mearns, l. c.)

e.—townsendi. (*Urocyon*), Merr. N. Am. Faun., No. 16, 1899, p. 103.

Type locality. Baird, Shasta County, California.

Geogr. Distr. Transition Zone, Shasta, California.

Genl. Char. Similar to *U. californicus*, but ears smaller, fulvous tints darker; rostrum broader, zygomata broader anteriorly; carnassials larger and thicker.

Color. Above grizzled gray and black, fulvous coloring darker than in *U. californicus*. Sides of neck and lower part of throat rufous; ears dark, grizzled fulvous, chin white. Tail like upper parts.

f.—ocythous. (*Urocyon*), Bangs, New Eng. Zool. Club, 1899, p. 43.

Type locality. Platteville, Wisconsin.

Geogr. Distr. Upper Mississippi Valley.

Genl. Char. Size large, colors deeper than typical style.

Color. As compared with *U. cinereo-argenteus*, back and sides are more yellowish, not so gray; red sides of neck, lower sides, arms and legs more ferruginous; under surface and sides of tail more ferruginous, less black and gray; outer surface of ear much more ferruginous without so marked a dull grayish, brown tip. (Bangs, l. c.)

Measurements. Type. Total length, 1024; tail vertebræ, 386; hind foot, 136.

Fam. III. **Ursidae.**

C. H. Merriam. *Preliminary Synopsis of the American Bears.* Proc. Biol. Soc. Wash., 1896, p. 65.

True molars with broad flat tuberculated crowns; fourth upper premolar with no inner root, bullæ scarcely inflated; soles naked; feet plantigrade.

Sub. Fam. I. **Ursinae.**

73. **Ursus.**

I. $\frac{3-3}{3-3}$; C. $\frac{1-1}{1-1}$; P. $\frac{4-4}{4-4}$; M. $\frac{2-2}{3-3}=42$.

Ursus, Linn., Syst. Nat., 1758, 1, p. 47. Type *U. arctus*, Linn.

Thalassarctos. Gray, Ann. of Phil., 1825, p. 62.

Danis. Gray, Ann. Philos., 1825, p. lv.

Euarctos. Gray, Proc. Zool. Soc., 1864, p. 692.

Size large; body heavy, bulky; three upper and under anterior molars very small with but a single root and frequently deciduous; fourth upper premolar lacks inner tubercle supported by a separate root; fourth premolar larger than those before it, the upper one has three roots, the lower one two; skull elongate, feet broad, toes armed with long, somewhat curved claws; non-retractile; palms and soles naked. Tail exceedingly short; ears erect, rather short, hairy.

A. *Thalassarctus*.

Neck elongate; upper tubercular molar elongate; palate broad, suddenly contracted behind last molar; posterior nasal aperture elongate, narrow; sides arched, contracted in middle. Soles of feet hairy, with small bald pads. Forehead nearly on line with nose.

467. *maritimus*. (*Ursus*), Desm., Mamm., 1820, p. 165.

Type locality. Arctic region.

Geogr. Distr. Arctic regions of the world.

Genl. Char. Head elongate; molars small and narrow.

Color. White at all seasons; sometimes portions of the pelage tinged with yellow or saffron.

Measurements. Total length, 2500-3300. Skull: greatest length, 407; greatest width, 245. Dimensions vary greatly among individuals.

B. *Ursus*.

Forehead concave, rounded; brain case swollen; nostrils ovate covered by a lid; nose longer than broad; palate flat; base of toes beneath covered with hair.

468. *middendorffi*. (*Ursus*), Merr., Proc. Biol. Soc. Wash., 1896, p. 69. pl. lv, figs. 2 and 3; pl. v, fig. 2; pl. vi, fig. 2; p. 70, fig. 7.

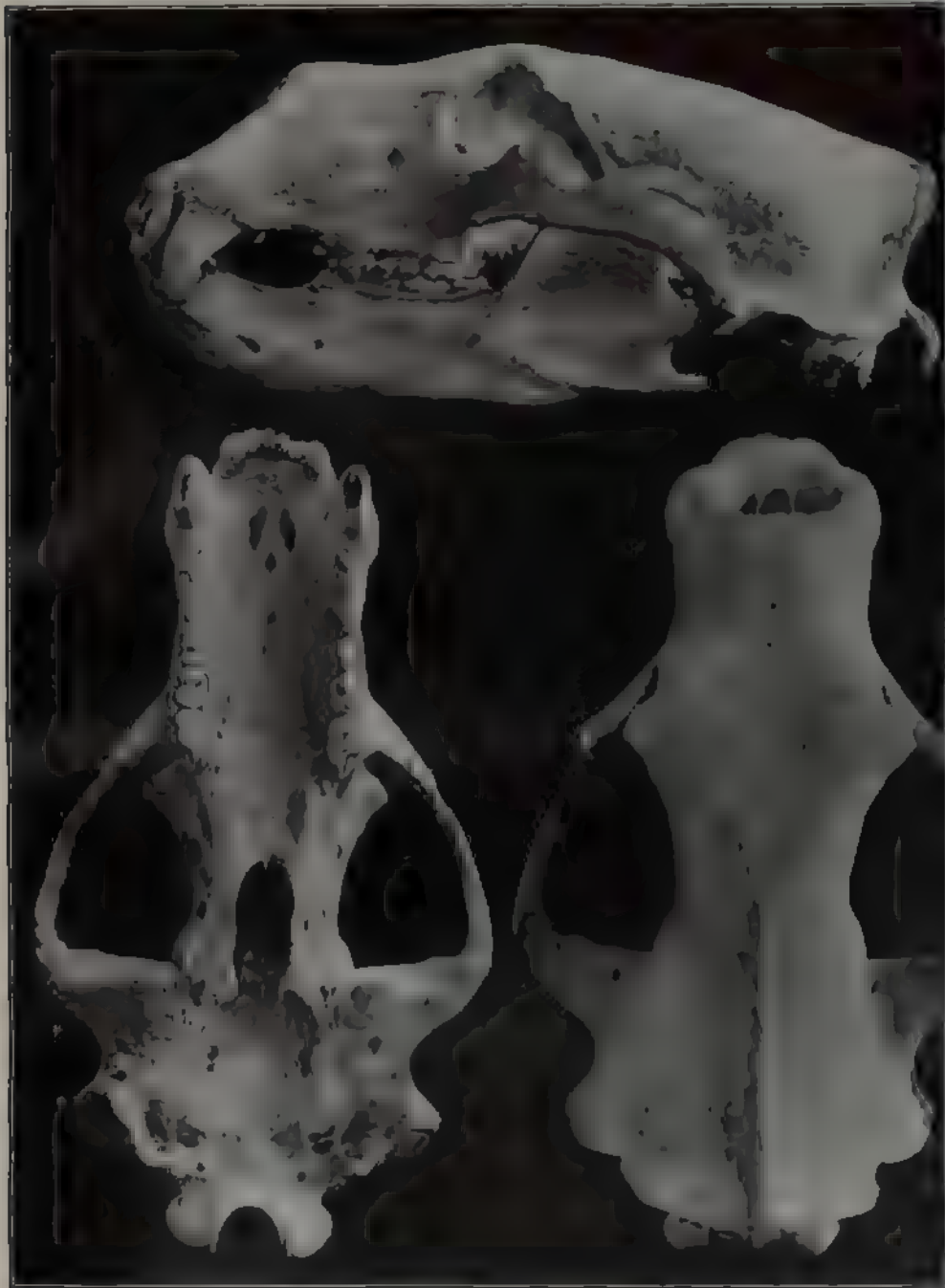
Type locality. Kadiak Island, Alaska.

Geogr. Distr. Kadiak Island, Alaskan Peninsula, Kenai Peninsula, Prince William Sound, Sushitna and Kuik River regions, and the Alaskan Mountains.

Genl. Char. Size large; frontal region in male considerably elevated, arched and rather narrow; postzygomatic part of skull very short.

Color. The color varies greatly among individuals, being of various shades and combinations of dark and yellowish browns.

Measurements. Skull: Front of premaxillary to end of occipital crest, 440; gnathion to occipital condyles, 392; gnathion to basion, 377; Hensel, 370; zygomatic breadth, 277; occipito-sphenoid length,



URSUS (THALASSARCTUS) MARITIMUS.
No. 34 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.

O. Davis.

"Fur shaggy, front claws much longer than the hinder, broadly depressed, whitish; palate narrow and contracted behind; ears small. Hind foot elongate."

470. horribilis. (*Ursus*), Ord, Guthr. Geog., 2nd Am. ed., 11, 1815, pp. 291, 299, 300.

Type locality. Montana.

Geogr. Distr. Rocky Mountains north of Wyoming and Utah; British Columbia to Alaska.

Genl. Char. Size large; fore claws very long and straight; whitish. Skull: frontal region elevated above orbits highest behind post-orbital processes, concealing sagittal crest.

Color. Usually brownish yellow with a blackish dorsal stripe; mane reddish brown, darkest near tips of hairs, which are brownish yellow or brown; legs generally black or blackish brown.

Measurements. Skull: total length, 380; end of intermaxillary to end of condyle, 262; greatest width, 235; between orbits, 86.

a.—alascensis. (*Ursus*), Merr., Proc. Biol. Soc. Wash., 1896, p. 74. (in text.)

Type locality. Norton Sound, Alaska.

Geogr. Distr. Not determined.

Genl. Char. "Compared with Rocky Mountain Grizzly it is somewhat larger, the frontal region is furrowed antero-posteriorly between the orbits, the palate averages longer, and the blade of the coronoid process of the mandible is narrower; the first lower molar is broader posteriorly and is much more abruptly and deeply narrowed on the outer side immediately in front of the posterior cusp. Except in a single skull (an old male from the Shaktolik River, No. 76,470), the combined length of the basioccipital and basisphenoid along the median line is decidedly less than half the length of the palate. In the Rocky Mountain Grizzly the occipito-sphenoid length is decidedly greater than half the length of the palate." (Merriam.)

b.—horriæus. (*Ursus*), Baird, Rept. Mex. Bound. Surv. Mamm., 11, pp. 24-29, 1859.

Type locality. Copper mines, Rio Mimbres, Grant County, southwestern New Mexico.

Geogr. Distr. Colorado and southern Utah, through New Mexico and Arizona to southern California.

Genl. Char. Size large, frontal region highest between post-orbital processes; temporal impressions nearly straight and elevated anteriorly, forming crests.



URSUS HORRIBILIS.

No. 35 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.



URSUS (EUARCTUS) AMERICANUS.
No. 36 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.

Measurements. "Skull: total length, 14.10 inches; end of intermaxillary to end of condyle, 13.70; greatest width, 7.20; greatest height above base of cranium, 4.10; distance between orbits, 2.85; distance between orbital processes, 3.80; length of nasal bones, 3.90; width before nasals, 1.30; narrowest part of muzzle behind canines, 3.10; upper incisors from front to molars, 3.18; to hinder margin of palate, 7; width between external edges, 1.80; upper molars, length taken together, 3; least distance between, 1.80; from intermaxillary to end of nasals, 6.27; to commencement of orbit, 5.60; between post-orbital points and occiput, 7.80; from postorbital points to end of nasals, 4.94; end of intermaxillaries, 7.40." (Baird.)

471. richardsoni. (*Ursus*), Mayne-Reid, Bruin; The Grand Bear Hunt, London, 1860, Am. ed., 1864, p. 260.

Type locality. Great Slave Lake, Arctic America.

Geogr. Distr. Barren Grounds between Hudson Bay and Mackenzie River; hilly regions east and north of Great Bear Lake; lower Rockies west of the Mackenzie, possibly to the upper tributaries of the Yukon."

Genl. Char. Frontal shield of skull truncated posteriorly by the temporal crests. These begin on the posterior edge of the postorbital processes, and go towards the median line, and form nearly a right angle with the cranial axis. Muzzle short and slightly upturned. Dentition is distinctly of the Grizzly type.

Color. Yellowish brown, sometimes very light, giving a "whitish appearance to the animal."

Measurements. Total length, 5 ft. 2 in.; tail, .6; height to top of shoulder, 2 ft. 9; length of sole of hind foot, .10. (Rich. Faun. Bor. Am., 1829, p. 24. Barren Ground Bear.)

D. *Enarctus*.

"Fur uniform throughout, either black or brownish; hair darkest towards tips; nose brown; feet moderate; fore claws not twice as long as the hinder."

472. americanus. (*Ursus*), Pallas, Spicil. Zool., fasc. xiv, pp. 5-7, 1780.

Type locality. Eastern North America.

Geogr. Distr. North America where forests exist, except perhaps in Louisiana and Florida.

Genl. Char. Size moderate; nails short; frontals usually elevated, zygomata width considerable; teeth rather small.

Color. Black; nose tan color.

Measurements. Average size of four skulls: Length of Hensel,

254; postpalatal length, 118; basion to plane of front of second upper molar, 168; zygomatic breadth, 184; ratio of zygomatic breadth to basilar length, 75. (Merriam.)

a.—sornborgeri. (*Ursus*), Bangs, Am. Nat., 1898, p. 500.

Type locality. Okak, Labrador.

Geogr. Distr. Labrador north to the limit of trees.

Genl. Char. Skull compared with one of *U. americanus* from Maine is "smaller, shorter and broader; brain case short and broad; zygoma widely spread; frontal region low, broad and flat, with great width across postorbital processes; nasals short; palate much shorter and broader; molar teeth longer."

Color. No skins have been obtained, therefore the color is unknown.

Measurements. Basilar length of Hensel, 205; occipito-nasal length, 187.4; zygomatic breadth, 129.6; mastoid breadth, 51.2; palatal length, 114.6; postpalatal length, 91; greatest length of single half of mandible, 164. (Bangs, l. c.)

473. luteolus. (*Ursus*), Griff. Carn. Anim., 1821, pp. 236, 237. (Col. pl.)

Type locality. Louisiana.

Geogr. Distr. Louisiana to Texas. Exact range unknown.

Genl. Char. Size large; skull long and flat; fronto-parietal region depressed; profile of top of skull (including crest) nearly a straight line; sagittal crest long and high, about half the length of upper side of skull in old age. Molars very large.

Color. Normally black. A specimen in Phil. Zool. Gardens (Forest and Stream, Dec. 16, 1892, p. 578), was rich reddish brown, almost bay. When worn, the coat became pale yellowish brown, uniform over all the body.

Measurements. Skull of type. Gnathion to end of occipital crest, 326; gnathion to basion, 292; basilar length of Hensel, 288; zygomatic breadth, 187; occipito-sphenoid length, 89; postpalatal length, 134; basion to plane of front of last upper molar, 103; interorbital breadth, 68; distance between postorbital processes, 97; occipito-nasal length, 276. (Merriam.)

474. floridanus. (*Ursus*), Merr. Proc. Biol. Soc. Wash., 1896, p. 81.

Type locality. Key Biscayne, Florida.

Geogr. Distr. Everglades of Florida.

Genl. Char. (Type.) Skull very long, high and narrow; frontal region remarkably elevated, highest immediately behind postorbital processes (more than 100 mm. above hinder part of palate); brain case very long and narrow; interpterygoid fossa very long (71 mm.);

basisphenoid and palate deeply excavated, the latter strongly arched both antero-posteriorly and transversely.

Color. Black.

Measurements. (Type skull.) Basion to gnathion, 282; basion to middle incisor, 277; zygomatic breadth, 190; occipito-sphenoid length, 91; basion to hinder edge of palate, 133; basion to plane of front of last molar, 186; interorbital breadth, 68; distance across postorbital processes, 109; occipito-nasal length, 290; greatest length of skull, 330; ratio of zygomatic breadth to basilar length, 68.5. (Merriam, l. c.)

475. emmonsii. (*Ursus*), Dall. Science N. S., No. 30, p. 87, July 26, 1895.

Type locality. St. Elias Alps. Yukatat Bay, Alaska.

Geogr. Distr. St. Elias range of mountains southeasterly to Juneau; exact range unknown.

Genl. Char. Size small, claws short, curved.

Color. The general color resembles that of the Silver Fox. The fur is not very long, but remarkably soft and with a rich under fur of a bluish black shade, numbers of the long hairs being white or having the distal half white and the basal part slaty. The dorsal line from the tip of the nose to the rump, the back of the very short ears and the outer faces of the limbs are jet black. Numerous long white hairs issue from the ears; black and silver is the prevalent pelage of the sides, neck and rump; the under surface of the belly and the sinuities behind the limbs are grayish white, or even nearly pure white, I am told, in some cases. The sides of the muzzle and the lower anterior part of the cheek are of a bright tan color, and this character is said to be invariable. There is no tint of brown elsewhere in the pelage. There is no tint visible in the pelts. The claws are small, very much curved, sharp, black above and lighter below. (Dall, l. c.)

Fam. IV. **Procyonidae.**

Head broad behind, tapering rapidly forward to a narrow muzzle; ears moderate; feet plantigrade; soles naked, skin papillose; toes free, capable of being widely spread; claws curved, acute, non-retractible; tail moderately long, semi-bushy, generally annulated; body rather stout; legs moderately long.

Sub. Fam. I. **Procyoninae.**

American species have the alisphenoid canal wanting in the skull.

74. *Bassariscus*.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{2-2}{2-2} = 40$$

Bassariscus. Coues, Science, 1887, 9, p. 516.

Bassariscus, (Licht), Wagl., Isis, 1831, p. 512 (nec. Höebner, Lept., 1816-21).

Head short, muzzle pointed; ears large; pads naked; soles hairy; body slender, elongated; tail long as body, annulated.

476. *astutus*. (*Bassariscus*), Licht., Wagler, Isis, 1831, p. 513.

Type locality. Mexico.

Geogr. Distr. California, Texas, Arizona, New Mexico.

Genl. Char. Body slender, elongate; muzzle pointed, tail long, bushy; claws half retractile; skull long, slender; postorbital process of frontal bone short; upper sectorial with inner cusp much developed; anterior cusp of lower sectorial shortest.

Color. Above yellowish brown and gray mixed; below white. Legs and feet like the body. Tail, white with six or eight alternate black rings.

Measurements. Total length, about 720; tail to end of hairs, 360. Skull: occiput to incisors, 79; Hensel, 69; zygomatic width, 47; mastoid width, 35; occipito-sphenoid length, 35; width of orbital constriction, 21.

a.—raptor. (*Bassariscus*), Baird, Rep. U. S. Mex. Bound. Surv. Mamm., 1859, 11, p. 19.

Type locality. California.

Geogr. Distr. California and Oregon.

Genl. Char. Similar to *B. astutus*. Skull more slender, nasals narrower and more pointed; postorbital processes of frontal bone lengthened; sectorials smaller and the inner cusp of upper one not so much developed. Orbital constriction very great.

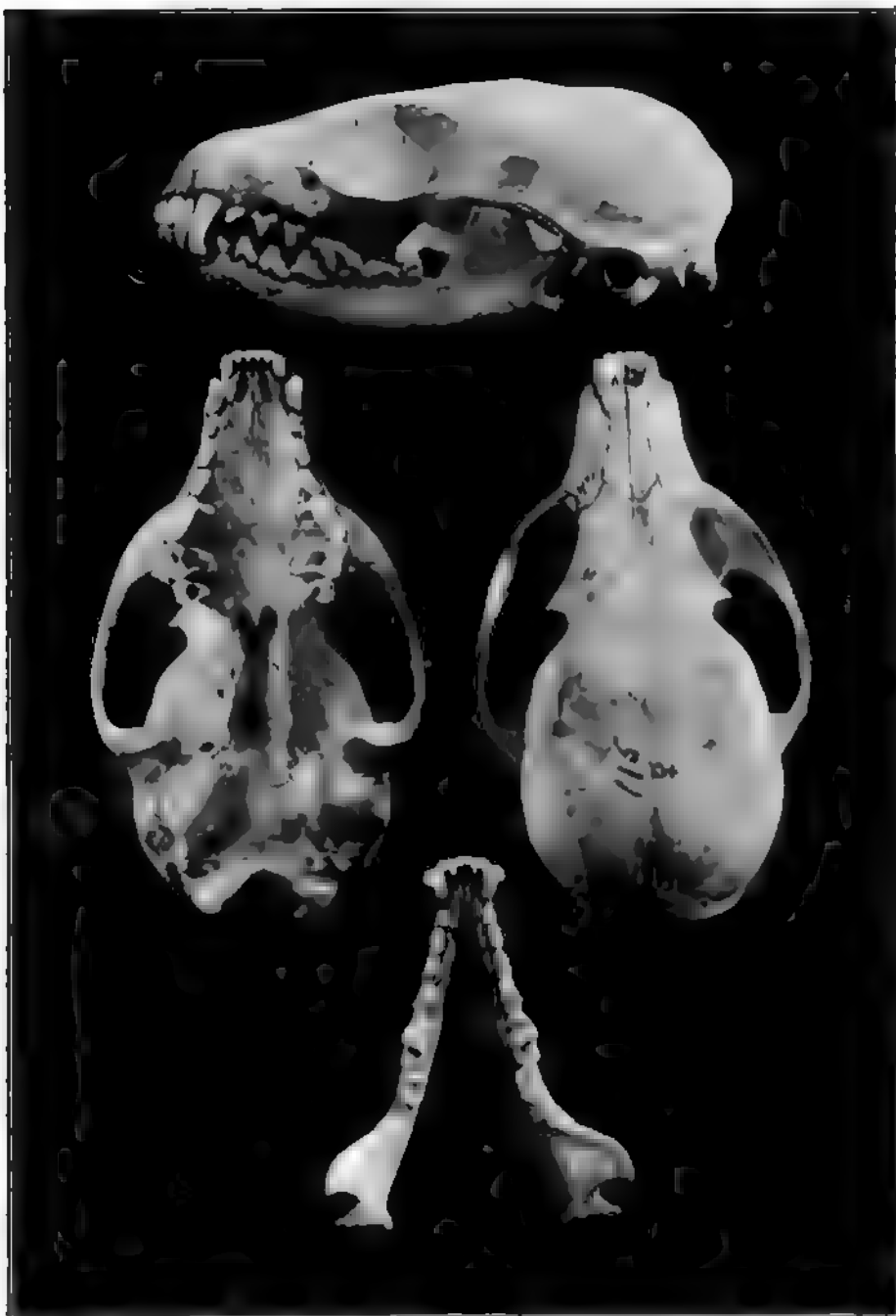
Color. Upper part of the body brownish yellow, darker than *B. astutus*, and not inclined to gray, many black hairs being interspersed among the others. Beneath buffy white. Tail, with black and white rings, much broader than those in the allied species.

Measurements. Total length, 717; tail, 365; hind leg, 70; ear, 47. Skull: occiput to incisors, 78; Hensel, 69; zygomatic width, 68; mastoid width, 35; width at orbital constriction, 16.

b.—flavus. (*Bassariscus*), Rhoades, Proc. Acad. Nat. Scien. Phila., 1893, p. 417.

Type locality. Texas.

Genl. Char. Size smaller than *B. astutus*; tail shorter than body, often entirely encircled by the black rings.



BASSARISCUS ASTUTUS RAPTOR.
No. 115 Field Columbian Museum Coll. Nat. size.

Color. Above blackish tawny, darkest on median line; sides yellowish; beneath tawny, lightest on throat and neck. Tawny spots above and below eyes, and at ear.

Measurements. Total length, 680-800; tail, 304-380; hind foot, 55-60. Skull: total length, 80; greatest breadth, 50; interorbital constriction, 20; tip to tip of postorbital process, 30.

c.—oregonus. (*Bassariscus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1893, p. 416.

Type locality. Rogue River? Oregon.

Color. Above, "dorsal region intense black, quite obscuring the brownish gray ground color. Below it is strongly brownish yellow, deepest on the throat and chin." (Rhoads, l. c.)

75. Procyon.

I. $\frac{3-3}{3-3}$; C. $\frac{1-1}{1-1}$; P. $\frac{4-4}{4-4}$; M. $\frac{2-2}{2-2}=40$.

Procyon. Storr, Prod. Meth. Mamm., 1780, p. 35. Type *Ursus lotor*, Linn.

Body stout; tail moderately long, semi-bushy, annulated; ears short, hairy; soles naked; muzzle acuminate.

477. lotor. (*Ursus*), Linn., Syst. Nat., 1758, 1, p. 48.

Type locality. Atlantic States?

Geogr. Distr. Eastern America from Canada to western Georgia, and west to the Rocky Mountains north of Texas.

Genl. Char. Feet plantigrade. Tail, moderate in length, cylindrical, bushy, not tapering; rest of characters same as the generic. Hind feet not exceeding four inches.

Color. Grayish white, tips of long hairs black. Black patch on cheek, paler one beneath the jaw, and one behind ear. Muzzle and back of cheek patch white. Tail bluish with black and white rings.

Measurements. Total length, about 775; tail, 262; hind leg, 105; ear, 50. Measurements vary greatly among individuals.

a.—hernandezii. (*Procyon*), Wagl., Isis, 1831, p. 514.

psora, Gray, Ann. Mag. Nat. Hist., 1842, 1, p. 580.

nivea, Gray, Ann. Mag. Nat. Hist., 1837, p. 261.

Type locality. Mexico?

Geogr. Distr. In the United States, from Texas to the Pacific, and north to Puget Sound.

Genl. Char. Size large, tail tapering, and the black rings only half as wide as the rusty whitish interspace. Hind feet exceeding four inches, above dark brown.



FIG. 62. PROCYON LOTOR.

No. 2539 Field Columbian Museum Coll. $\frac{1}{2}$ Nat. size.

Color. Very similar to *P. lotor*, but recognizable by the narrow black rings on the tail, and the dark brown feet, and in its generally larger size.

Measurements. Total length, 533; tail, 143; ear, 35; hind foot, 80; fore foot, 60.

b.—pallidus. Merr., Proc. Biol. Soc. Wash., 1900, p. 151.

Type locality. New River, Colorado Desert, California.

Genl. Char. Size medium, colors pale.

Color. Pale gray, black markings on head narrow; no yellow suffusion anywhere perceptible.

Measurements. Total length, 855; tail vertebræ, 295; hind foot, 128.

c.—pacifcus. (*Procyon*), Merr., N. Am. Faun., No. 16, 1899, p. 107.

Type locality. Kechelus Lake, Cascade Mountains, Washington.

Geogr. Distr. Puget Sound, and basal slopes of northern Cascades.

Color. Above dark gray mixed with black; beneath sooty plumbeous sprinkled with white hairs; black rings on tail continuous; pale rings obscured above with black.

Measurements. Total length, 940; tail vertebræ, 310; hind foot, 115.

d.—elucus. (*Procyon*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, xxviii, p. 219.

Type locality. Oak Lodge, Brevard County, Florida.

Geogr. Distr. Eastern Georgia and Florida.

Genl. Char. Size rather larger than *P. lotor*, tail usually longer; ears more rounded, skull not so constricted behind postorbital processes, frontal region high and arched.

Color. Variable; under fur mouse-gray to yellowish drab gray, long hairs above ringed with dull yellow and black; above shoulders large patch of orange rufous, some hairs black tipped; rest of pelage dull yellow, ochraceous on cheeks, sides of throat, vent and root of tail; lips and chin dull yellow. Usual black band on cheeks. Tail ringed with ochraceous blackish brown.

Measurements. Type. Total length, 892; tail vertebræ, 286; hind foot, 125. Skull: basal length, 109.6; zygomatic breadth, 81.2; mastoid breadth, 64.6; postorbital processes, 24.8; mandible length, 88.4. (Bangs l. c.)

Fam. V. **Mustelidae.**

A single tubercular molar tooth on either side of both jaws; in upper molar the inner tubercular portion longest in the antero-posterior direction; bullæ slightly inflated; palate extending beyond the last molars; feet five-toed, plantigrade, or digitigrade. No Cæcum.

Sub. Fam. I. **Molinae.**

Large quadrate posterior upper molar; molars in jaws unequal.

76. **Taxidea.**

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{1-1}{2-2} = 34.$$

Taxidea. Waterh. Proc. Zool. Soc., 1838, p. 154. Type *M. americana*, Bodd.

Body stout, strong, depressed; tail short; upper carnassial largest in proportion to other teeth; upper molar triangular, the apex turned backward; fore claws very large, strong. Skull wedge-shaped, widest posteriorly.

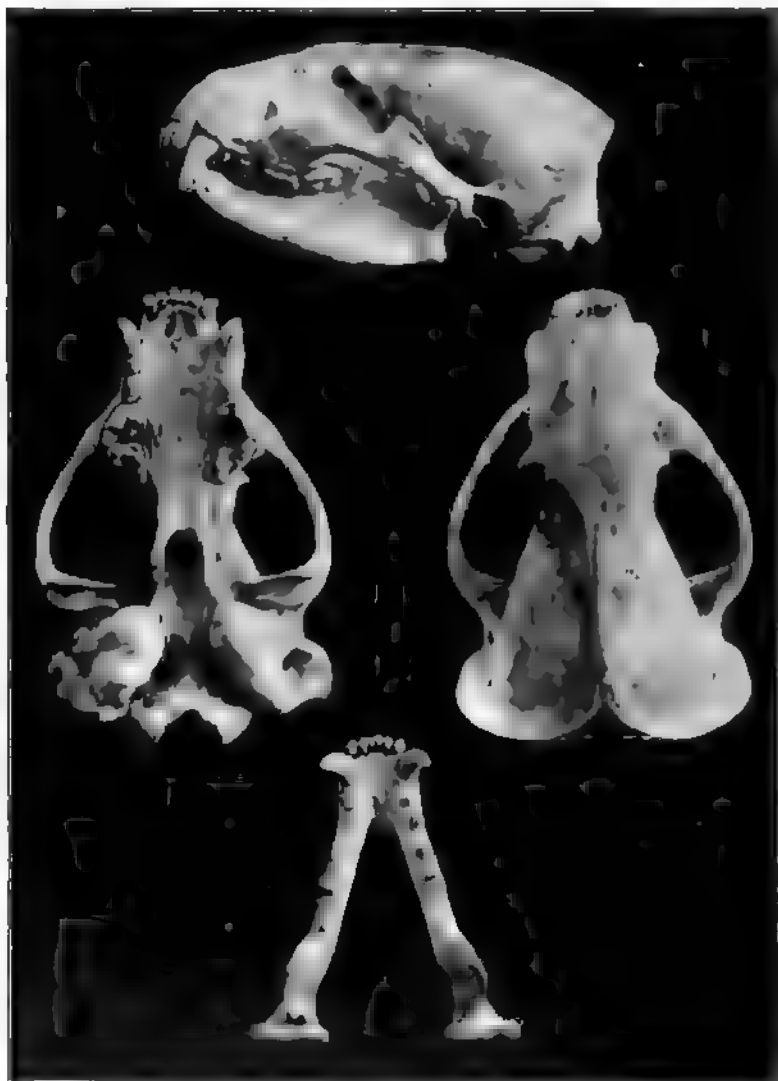


FIG. 63. TAXIDEA AMERICANA.

No. 3 Field Columbian Museum Coll. $\frac{1}{2}$ Nat. size.

478. *americana*. (*Meles*), Bodd. Elench. Anim., 1787, 1, p. 136.
labradoria, Gmel. Syst. Nat., 1788, 1, p. 102.
jeffersoni, Harlan, Faun. Am., 1825, p. 309.

Type locality. Hudson Bay.

Geogr. Distr. Hudson Bay, north latitude 58° in British North America, and in the United States from Wisconsin south to Oklahoma Territory, west to Rocky Mountains. Formerly as far east as Ohio.

Genl. Char. Body stout, depressed; tail short; fore claws long; occipital region of skull very wide, lambdoidal crest greatly developed, sagittal but slightly.

Color. Head hoary brown, sometimes grayish; snout and patch behind the ears black. Line from nose to nape white. Cheeks white, legs black.

Measurements. Head and body, about 340; tail vertebræ, 140.

a.—neglecta (*Taxidea*), Mearns, Bull. Am. Mus. Nat. Hist., N. Y., 1891, p. 250.

Type locality. Fort Crook, northern California.

Geogr. Distr. California.

Genl. Char. Smaller than *F. americana*, tail longer. Skull narrower, more restricted in the interorbital region, bony palate slightly longer, bullæ considerably larger.

Color. Dark markings of head more brownish than *T. americana*, light areas yellowish instead of whitish; feet and lower part of legs dark brown instead of glossy black; hairs of upper surface ochraceous buff banded subbasally with grayish drab, subspirally with black, and broadly tipped with yellowish gray; tail tawny ochraceous, the hair pointed with grayish above except at the tip, which is dark brown; end of chin light brown; under side of head and neck yellowish clay-color; chest and sides of abdomen tawny ochraceous, creamy white in the middle of the abdomen, claws horn color.

Measurements. Skull: occipital condyle to front of premaxillæ, 118; basilar length of Hensel, 106; occipito-nasal length, 101; interzygomatic breadth, 75; intermastoid breadth, 71; across postorbital processes, 31; alveolar rim of incisors to postpalatal notch, 59.5; postpalatal notch to foramen magnum, 46; height of cranium at plane of audital meatus, 40; length of pterygoid fossa, 13. (Mearns.)

b.—berlandieri. (*Taxidea*), Baird, Mam. N. Am., 1857, p. 205.

Type locality. Llano, Estacado, Texas.

Geogr. Distr. Texas, Oklahoma Territory, Arizona, and New Mexico to Mexico.

Genl. Char. A conspicuous white stripe from nose along entire body to the tail.

Color. Reddish gray; blackish brown on head, and same color on neck and back along the median white stripe, the hairs tipped with

white, giving this part a grizzled appearance. Cheeks white with a black patch in front of ear. Under parts buff, except throat and chin, which are white. Legs black, tail like the back.

Measurements. Total length, 710; tail vertebræ, 120; hind leg, 103.

77. Mephitis.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{1-1}{2-2} = 34.$$

Mephitis. Cuv. Leç. Anatom. Comp., 1800, p. 1.

Upper posterior molar larger than the carnassial, subquadrate; palate reaching to hinder border of last molar; body elongate; limbs moderate subplantigrade; head small; nose pointed; tail long, bushy; anal glands greatly developed.

479. mephitica. (*Viverra*), Shaw, Mus. Lever., 1792, p. 171.

chinga, Tied. Zool., 1808, 1, p. 362.

macrura, Aud. & Bach. (nec Licht), Quad. N. Am., 111, pl. 102.

varians, Gray (nec Baird), Mag. Nat. Hist., 1837, p. 581.

Type locality. Unknown.

Geogr. Distr. Nova Scotia, Quebec, Ontario, south and west to Virginia and Indiana.

Genl. Char. Size large, tail penicillated; heel hairy.

Color. Black; narrow frontal line, triangular nuchal patch, a line on both sides of back nearly to tail, and end of tail white. Markings vary considerably among individuals.

Measurements. Total length, 682; tail vertebræ, 171; hind foot, 83. Skull: basilar length, 71.6; occipito-nasal length, 74.6; zygomatic breadth, 52; mastoid breadth, 43.8; mandible, 52.8.

a.—hudsonia. (*Mephitis*), Rich. Faun. Bor. Am. Mamm., 1829, p. 55.

Type locality. Hudson Bay?

Geogr. Distr. North of Canada, Hudson Bay westward to plains of the Saskatchewan?

Genl. Char. Similar in color and markings to *M. mephitica*, but larger, palate without median spine. End of tail blunt, bushy.

Color. A narrow white mesial line runs from the tip of the nose to the occiput, where it dilates into a broad white mark. It is again narrowed, and continues so until it passes the shoulders, when it forks, the branches running along the sides, and becoming much broader as they recede from each other. They approach posteriorly and unite on the rump, becoming at the same time narrower. In some few specimens the white stripes do not unite behind, but disappear on the flanks. The black dorsal space included by the stripes is egg-shaped, the narrow end of which is towards the shoulders.

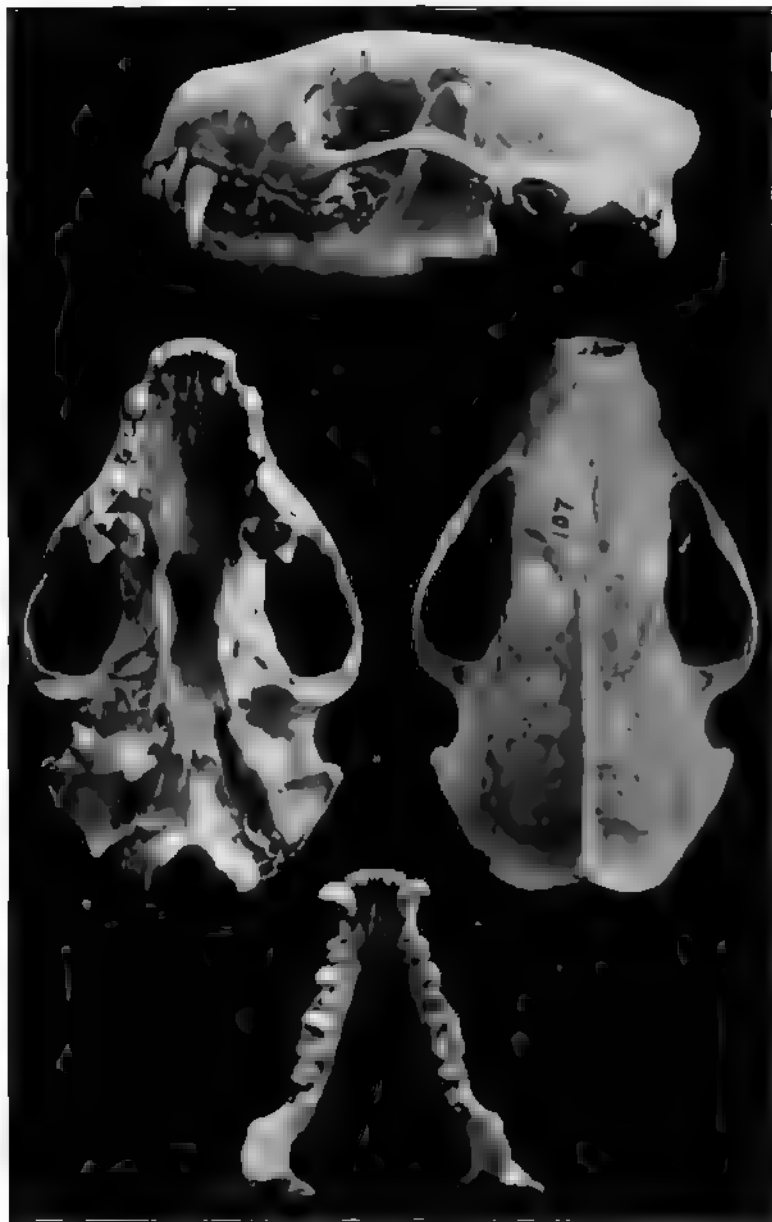


FIG. 46. *MEPHITIS MEPHITICA*.

No. 107 Field Columbian Museum Coll. Nat. size.

The sides of the head and all the under parts are black. The hair on the body is long. The tail is covered with very long hair and has

generally two broad longitudinal white stripes above on a black ground. Sometimes the black and white colors of the tail are irregularly mixed. Its under surface is black. (Richardsoni, l. c.)

Measurements. Total length, 600; tail vertebræ, 255; hind foot, 83.

b.—scrutator. (*Mephitis*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 141.

Type locality. Cartville, Acadia Parish, Louisiana.

Geogr. Distr. Mississippi Valley to Indian Territory; from Louisiana eastward across Alleghanies to Virginia, merging northward into *M. mephitica*.

Genl. Char. Small; tail medium penicillated; feet small. Skull: palate ending in medium spine.

Color. Color and markings as in true *M. mephitica*, but much more variable. The two lateral white stripes are often so wide as to meet on the back for nearly their whole length, forming the predominating color of the upper parts. In other specimens the lateral stripes are reduced to two small points of white projecting backward from the nuchal patch, the rest of the upper parts, except the frontal stripe and nuchal patch being black.

Measurements. Total length, 580; tail vertebræ, 208; hind foot, 64. Skull: basilar length, 60; occipito-nasal length, 63.2; zygomatic breadth, 44; mastoid breadth, 35; length of mandible, 45.6. (Bangs, l. c.)

480. elongata. (*Mephitis*), Bangs, Proc. Biol. Soc. Wash., 1896, p. 142.

Type locality. Micco, Brevard County, Florida.

Geogr. Distr. Peninsular Florida, and southern Georgia, western limit unknown.

Genl. Char. Size large, tail long, penicillated; feet long and slender, markings variable. Skull, median spine at end of palate.

Color. Color and markings as in *M. m. scrutator*, and with like variations, some being all black save tip of tail and nuchal patch, while another has most of the tail and the back, except the median line on the rump white.

Measurements. Total length, 719; tail vertebræ, 321; hind foot, 76. Basilar length of skull, 66.4; occipito-nasal length, 71; zygomatic breadth, 49.2; mastoid breadth, 40; mandible greatest length, 50.8.

481. occidentalis. (*Mephitis*), Baird, Mamm. N. Am., 1857, p. 195 (fig. cran.).

Type locality. Petaluma? California.

Geogr. Distr. California, Oregon and Washington.

Genl. Char. Tail vertebræ two-thirds the length of head and body. Bony palate with small, narrow emargination in the middle of its posterior edge. Color black, with a white nuchal patch, bifurcating behind and reaching to the tail, which is entirely black.

Color. Black, narrow line of white on the forehead between the eyes; a nuchal patch commences behind the ears and extends to the shoulders, then bifurcates into two narrow lines, which extend along the side of the back, diverging most in its middle portion, and approximating the base of the tail, opposite which it abruptly ceases, the two an inch or more apart. The exterior of the tail is entirely black; the bases of all the hairs are white, this color reaching nearer to the end of the hairs along the median portion.

Measurements. Total length, 800; tail vertebræ, 312; hind foot, 76; length of skull, 80; width, 51.

482. *milleri*. (*Mephitis*), Mearns, Proc. U. S. Nat. Mus., xx, 1897, p. 467.

Type locality. Fort Lowell, near Tucson, Arizona.

Genl. Char. Body slender, longer than head and body; nape with a hood of spreading, elongated hair.

Color. Black with white stripe low down on the sides from the ear to the tail. Head with a narrow white stripe above and all around subterminally; tail black, base of hairs white, under side all white, except the terminal black ring; tuft at end white. Feet and under parts black.

Measurements. Total length, 790; tail vertebræ, 435; hind foot, 73.

483. *mesomelas*. (*Mephitis*), Licht., Darst. N. Säugth., 1827, pl. 45, fig. 2.

Type locality. Louisiana.

Geogr. Distr. Northern and eastern Texas, Oklahoma and Louisiana.

Genl. Char. Size large, tail bushy, truncated, no white at end. Skull long and narrow; dentition heavy.

Color. Black, narrow white frontal stripe, not reaching nuchal patch, which is broad, square in front, narrowing posteriorly. Behind the shoulders it separates into two broad, white bands, which pass along the flanks to root of tail. Tail has the hairs white for basal half, rest black. Some hairs are all white.

Measurements. Total length, 731; tail vertebræ, 229; tail to end of hairs, 299. Skull: occipital condyle to anterior border of premaxillæ, 74; basilar length, 66; zygomatic breadth, 46; mastoid

breadth, 38.5; palatal length, 27.5; pterygoid fossa, 16.5; height of cranium at basisphenoid, 23.5; length of tooth row, 24; length of mandibular ramus, 50.

484. estor. (*Mephitis*), Merr., N. Am. Faun., No. 3, 1890, p. 81, pl. x, fig. 1.

Type locality. San Francisco Mountain, Arizona.

Geogr. Distr. Arizona.

Genl. Char. Size small; tail short; soles naked. Skull: palate not reaching posterior line of the last molar; distinct pit between the bullæ and postglenoid process absent.

Color. Narrow frontal stripe and nuchal patch white, the latter occupying entire occipital region, and extending narrowly on the shoulders, then expanding over all the lower back and rump (sometimes in the center of the back a narrow black stripe appears amid the white), and then continues over the tail, extending beyond the tip. Through this thin white "veil" the black beneath shows through; under parts black with white patches on throat.

Measurements. Total length, 640; tail vertebræ, 256; pencil, 140; hind foot, 67.

485. spissigrada. (*Mephitis*), Bangs, Proc. Biol. Soc. Wash., 1898, p. 31.

Type locality. Sumas, British Columbia.

Genl. Char. Size long; tail long, heel densely hairy; palate short, the notch a smooth curve, and not reaching beyond posterior line of last molar.

Color. Black; frontal stripe, nuchal stripe, and lateral stripes white, the latter extending from nuchal patch to and down sides of tail, and overhanging the blunt tip.

Measurements. Skull: Basal length, 68; occipito-nasal length, 69.6; zygomatic breadth, 49.6; mastoid breadth, 41; single half of mandible, 50. (Bangs, l. c.)

486. factulenta. (*Mephitis*), Elliot, Field Columb. Mus. Pub., 1899, 1, p. 269, Zoöl.

Type locality. The Lagune near Port Angeles, Washington.

Genl. Char. Differs from *M. spissigrada* in having the pterygoid fossa longer; basi-occipital narrower and shorter; palatal arch notched in the center; posterior portion of parietals constricted and with an abrupt slope to the squamosal; longer and narrower nasals, and larger bullæ. Heels slightly hairy; claws long, white with dark brown tips on fore feet, reddish on hind feet.

Color. Black; narrow line between eyes; nuchal patch, stripe to shoulders, and lateral stripes extending to end of tail white. Towards

the terminal portion the white covers the entire width of the tail, extending beyond blunt black tip.

Measurements. Total length, nose to end of hairs of tail, 770; tail to end of hairs, 300; hind foot, 70. (Skin.) Skull: Occipito-nasal length, 70; nasals 18; zygomatic width, 47; mastoid breadth, 40; length of pterygoid fossa, 16; basi-occipital, 12.

487. avia. (*Mephitis*), Bangs, Proc. Biol. Soc. Wash., 1898, p. 32.

Type locality. San Jose, Illinois.

Geogr. Distr. Central prairie region between the range of *M. m. hudsonia* on the north, and *M. m. scrutator* on east and south.

Genl. Char. Size small; tail very short; heel hairy with a narrow medial naked stripe. Skull highly arched in frontal region, palate without median spine; mastoid and paroccipital processes much reduced; bullæ inflated. Sagittal crest high.

Color. Black; the usual white frontal stripe, nuchal patch, and two lateral stripes. Tail very short and bushy, black externally, most of the hairs white at base.

Measurements. Total length, 675; tail vertebræ, 190; hind foot, 65.

78. Spilogale.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{1-1}{2-2} = 34.$$

Spilogale. Gray, Proc. Zool. Soc., 1865, p. 150.

"Head conical. Nose short with a distinct central groove; muzzle small, bald, rather notched in front; nostrils lateral. Tail short, cylindrical, bushy, not so long as the body, ending in a long pencil of hair. Hind foot moderate; sole bald, flat, the *front portion divided into four oblong pads*, the central one small and triangular, before the others, hinder part narrow; front claws elongate, brown. False grinders, $\frac{2}{3}$; upper tubercular grinder square, moderate sized." (Gray, l. c.)

488. putorius. (*Viverra*), Linn. Syst. Nat., 1758, p. 44. Type *P. americanus striatus*. Catesby.

Type locality. Carolina or Florida.

Geogr. Distr. Florida?

Genl. Char. Size small; tail shorter than head and body; white patch outside the thigh, and none on upper side of foot.

Color. Black with the white stripes and spots usually seen on members of this genus, but in addition a patch on thigh and on foot as stated above; sometimes the rump spots and leg stripe are continuous; upper surface of basal portion of tail is white, being covered by the united stripes on the rump.



FIG. 65. SPILOGALE PUTORIUS.

No. 622 Field Columbian Museum Coll. Nat. size.

Measurements. Total length, 372; tail vertebræ, 129; hind foot, 39.

489. interrupta. (*Mephitis*), Rafin. Ann. Nat., 1820, 1, p. 3.

bicolor, Gray, Ann. Mag. Nat. Hist., 1837, 1, p. 583.

quaterlinearis, Winans, Coues Fur-bear. Anim., 1877, p. 239.

Type locality. Upper Missouri?

Geogr. Distr. Kansas, Oklahoma Territory, Texas.

Genl. Char. Tail large, black, slender white tuft at tip. White markings on body limited in extent; postorbital processes small.

Color. Black; small spot on forehead and crescent before ears;

two stripes from nape, one from each ear to middle of back; one broad lateral stripe from behind each fore leg joining a broad patch on side below the back stripes; two patches on middle of back; interrupted rather broad band across rump; and patch on rump either side of base of tail white. Tail black, tuft at tip extending beyond end of tail white.

Measurements. Total length, 538; tail vertebræ, 215; hind foot, 47.

490. ringens. (*Spilogale*), Merr., N. Am. Faun., No. 4, 1890, p. 9.

Type locality. Greensborough, Hale County, Alabama.

Geogr. Distr. Alabama, western Georgia, north to West Virginia, and Virginia.

Genl. Char. Larger than *S. putorius*, tail vertebræ shorter than head and body; no white on legs and feet; white of tail over one-third apical portion above, and one-half below.

Color. Black. Small frontal spot; crescent in front of ears not continuous, with lateral stripe; four narrow stripes running from behind ears and nape to middle of back; lateral stripe from shoulders curving on to back; two on rump, and one on either side of the root of the tail, and a large one in front of each thigh, sometimes joining by an irregular broken line on the back, and tip of tail white.

Measurements. Total length, 460; tail vertebræ, 165; hind foot, 45; pencil, 88.

491. indianola. (*Spilogale*), Merr., N. Am. Faun., No. 4, 1890, p. 10.

Type locality. Indianola, Matagorda Bay, Texas.

Geogr. Distr. Texas.

Genl. Char. White stripes narrow and restricted; terminal third of tail white.

Color. Black, minute spot on forehead, narrow crescent in front of ears, two very narrow lines from nape to rump, interrupted on shoulders and middle of the back, two wider but slender lateral stripes from back of ear to lower part of flanks; short stripe from behind shoulder, sometimes connecting with a large spot on lower part of flanks, and extending on to the back, large spot in front of thighs, two long spots on middle of rump and a small round one on each side of rump, and terminal third of tail white.

Measurements. From skin possibly a little stretched. Total length, 630; tail to end of hairs, 280; hind foot, 45.

492. leucoparia. (*Spilogale*), Merr., N. Am. Faun., No. 4, 1890, p. 11.

Type locality. Mason, Mason County, Texas.

Geogr. Distr. Texas.

Genl. Char. White markings on back equaling the black area; middle dorsal stripes continuous posteriorly with anterior transverse stripes, which last are confluent with posterior transverse stripes; under jaw straight or nearly so below; bullæ large; mastoid capsules inflated.

Color. Black, with the usual style of white markings. In addition to the peculiarities mentioned among the general characters, the following are added: Lumbar spots generally confluent with the posterior transverse stripes. The tail spots are sometimes confluent posteriorly, forming a narrow band across the base of the tail. No white on thighs, and only rarely a few white hairs on the upper surface of the foot. (Merriam.)

Measurements. Total length, 400; hind foot, 45.

493. gracilis. (*Spilogale*), Merr., N. Am. Faun., No. 4, 1890, p. 12.

Type locality. Grand Cañon of the Colorado, Arizona.

Geogr. Distr. Arizona.

Genl. Char. Size medium. Skull broad and flat; fronto-parietal region depressed. Postorbital constriction very great.

Color. Pattern similar to other species of the genus in black and white. External lateral stripe very large and broad, and broadly confluent with the anterior transverse stripe, which in turn is sometimes narrowly confluent with the inner dorsal stripe. Exposed white of tail occupies nearly the whole of the terminal half above and the terminal two-thirds below. (Merriam, l. c.)

Measurements. Total length, 400; tail vertebræ, 142; pencil, 100; hind foot, 46.

494. saxatilis. (*Spilogale*), Merr., N. Am. Faun., No. 4, 189, p. 12.

Type locality. Provo, Utah.

Geogr. Distr. Utah.

Genl. Char. Size large; tail longer than head and body; lateral stripe nearly obsolete.

Color. Black and white, similar in distribution to the general style of the animals of this genus, with the following differences, as indicated by its describer (l. c.). External lateral stripe nearly obsolete, and barely or not continuous with anterior transverse stripe. In the type none of the markings are confluent, but in another specimen the anterior transverse stripes and the caudal spots meet indistinctly across the base of the tail. All other spots and markings are distinct.

Measurements. Total length, 450; tail vertebræ, 176; pencil, 100; hind foot, 49.

495. phenax. (*Spilogale*), Merr., N. Am. Faun., No. 4, 1890, p. 13.

Type locality. Nicasio, Marion County, California.

Geogr. Distr. California.

Genl. Char. Size large. Skull without postorbital constriction; postorbital processes most largely developed of all the species.

Color. "Resembles *S. saxatilis*, but lateral stripes are broader; lumbar spots inclined to become confluent with posterior transverse stripes, other markings normal. Considerable white in patches about the chin and angles of the mouth. Exposed white portion of tail occupying terminal third above, and terminal half below."

Measurements. "Total length, 434; tail vertebræ, 120; hind foot, 51; ear, 29. Skull: interorbital breadth, 29.4; across postorbital processes, 37; molars, 41.6; mastoids, 64; brain case, 49." (Merr., l. c.)

a.—latifrons. (*Spilogale*), Merr., N. Am. Faun., No. 4, 1890, p. 15.

Type locality. Roseburg, Douglas County, Oregon.

Geogr. Distr. Oregon.

Genl. Char. "Similar to *S. phenax*, but much smaller. Skull is broader interorbitally across the postorbital processes, as well as across the brain case, mastoids and palate. Last lower molar smaller than *S. phenax*."

Color. No peculiarities in the markings appear, except the white under the chin, which is much less extensive than in *S. phenax*.

Measurements. "Total length, 335; tail vertebræ, 130; pencil, 90; hind foot, 40. Skull: interorbital breadth, 32.4; across postorbital processes, 38.9; across molars, 43.2; across mastoids, 65.5; brain case, 55.1." (Merriam, l. c.)

b.—arizonæ. (*Spilogale*), Mearns, Bull. Am. Mus. Nat. Hist., 1891, p. 256.

Type locality. Fort Verde, Arizona.

Geogr. Distr. Central Arizona.

Genl. Char. Smaller than *S. phenax*, feet longer, fur finer and softer. Skull smaller and relatively broader than in *S. phenax*, with more spreading and higher zygomatic arches; postorbital constriction marked; postorbital processes but slightly developed.

Color. Pattern similar to *S. phenax*; usually without the white markings on chin, but retaining those at angle of the mouth; white stripes averaging a trifle narrower, and snowy instead of creamy white; rump spots smaller, and those on sides of tail at base only confluent above in one specimen, black areas faded to brownish and grayish black, instead of glossy black, especially below.

Measurements. Type. Total length, 445; head and body, 305; tail vertebræ, 160; end of hairs, 260; hind foot, 50. (Mearns, l. c.)

496. olympica. (*Spilogale*), Elliot, Pub. Field Columb. Mus, 1899, 1, p. 270, Zool.

Type locality. Lake Sutherland, Olympic Mountains, Washington.

Geogr. Distr. Northwest Washington.

Genl. Char. Skull long and broad; outline of occipital region greatly curved, and a deep indentation at the posterior termination of the sagittal crest, which barely arises above the plane of the skull. The frontals are longer than in *S. latifrons*, the nasals shorter; a longer palatal bone and pterygoid fossa. Bullæ less inflated. Last molar nearer the palatal notch.

Color. Similar to *S. latifrons*, but differs as follows: White mark on forehead is long, comparatively narrow, diminishing gradually, and ending in a point posteriorly, and reaching nearly to a line drawn across head from base of ears. White stripe behind eyes and along the back is much broader and more extensive in front of ears. A moderately broad line commences just back of shoulder and runs parallel with the lateral line above described and crosses up to the back in front of hips. The corresponding line in *S. latifrons* is merely a broad patch from back to front of hips. General color is a clear black, the markings pure white.

Measurements. Total length, 320; tail vertebræ, 104; pencil, 60; hind foot, 41.

497. ambavarlis. (*Spilogale*), Bangs, Proc. Bost. Soc., 1898, p. 222.

Mephitis bicolor. Allen, (nec. Gray), Bull. Mus. Comp. Zool., 1871, p. 169.

Spilogale putorius. Merr. N. Am. Faun., No. 4, 1890, p. 7, (nec Linn.).

Type locality Oak Lodge, Brevard County, Florida.

Geogr. Distr. East Peninsula. Indian River, Florida.

Genl. Char. Size small, hind foot small, tail very short, all the white markings extensive; pelage short and very soft; skull small, narrow and high.

Color. All the white stripes and marks large and conspicuous; in addition to usual markings there are white spots on outside of thigh, on upper surface of foot and at base of tail; a long white pencil at end of tail.

Measurements. Type. Total length, 381; tail vertebræ, 147; hind foot, 39.5. Skull; basal length, 46; zygomatic breadth, 33; mastoid breadth, 27.8; across postorbital processes, 16.8. (Bangs, l. c.)



GULO LUSCUS.

No. 30 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.

Sub. Fam. II. **Mustelinae.**

Sectorial of lower jaw followed by a tubercular molar; phalanges bent up, withdrawing claws into sheaths.

79. Gulo.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{1-1}{2-2} = 38.$$

Gulo. Storr. Prod. Meth. Anim., 1780. Type *Ursus luscus*. Linn.

Size large, stout, bear-like; legs short, stout; tail short, bushy; soles hairy, naked pads six; claws strong, curved, acute. Skull massive, superior outline arched; occipital sloping rapidly; zygomata powerful, widely divergent, high posteriorly; paroccipitals and mastoids enlarged; bullæ inflated on interior half, laterally elongated into auditory tubes; orbital constriction slight; palate broad, the sides straight; pterygoids stout at base, but terminating in slender hamular processes; lambdoidal crests strong and flaring; sagittal crest in old individuals high, thin. Rostrum short, stout, truncated anteriorly. Lower sectorial without internal cusp; anterior lower premolar with main cusps subequal in size and elevation.

498. luscus. (*Ursus*), Linn. Syst. Nat., 1766, 1, p. 71.

Type locality. Europe.

Geogr. Distr. Boreal North America from Atlantic to the Pacific Oceans, south to the basin of the Great Salt Lake.

Genl. Char. Body stout, legs short, tail short, skull massive; characters those of the genus.

Color. Deep purplish brown or blackish brown; bands of chestnut brown begin at the shoulders, pass along the sides, and meet on rump at base of tail, enclosing a pale dorsal area; on throat and chest are one or more light spots; a hoary patch on front and sides of head; legs, feet and under parts blackish; claws whitish.

Measurements. Total length, 865–1080; tail vertebræ, 188–235; hind foot, 164–180; ear, 50.

80. Mustela.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{1-1}{2-2} = 38.$$

Mustela. Linn. Syst. Nat., 1766, 1, p. 66. Type *M. lutra*.

Body long and slender; limbs short, digitigrade; tail moderate, bushy; soles furred, pads naked; claws compressed, acute, semi-retractile; lower sectorial usually with small internal cusp; upper carnassial with one close to anterior edge; orbital constriction considerable; superior outline of skull arched; zygomatic arch high posteriorly.

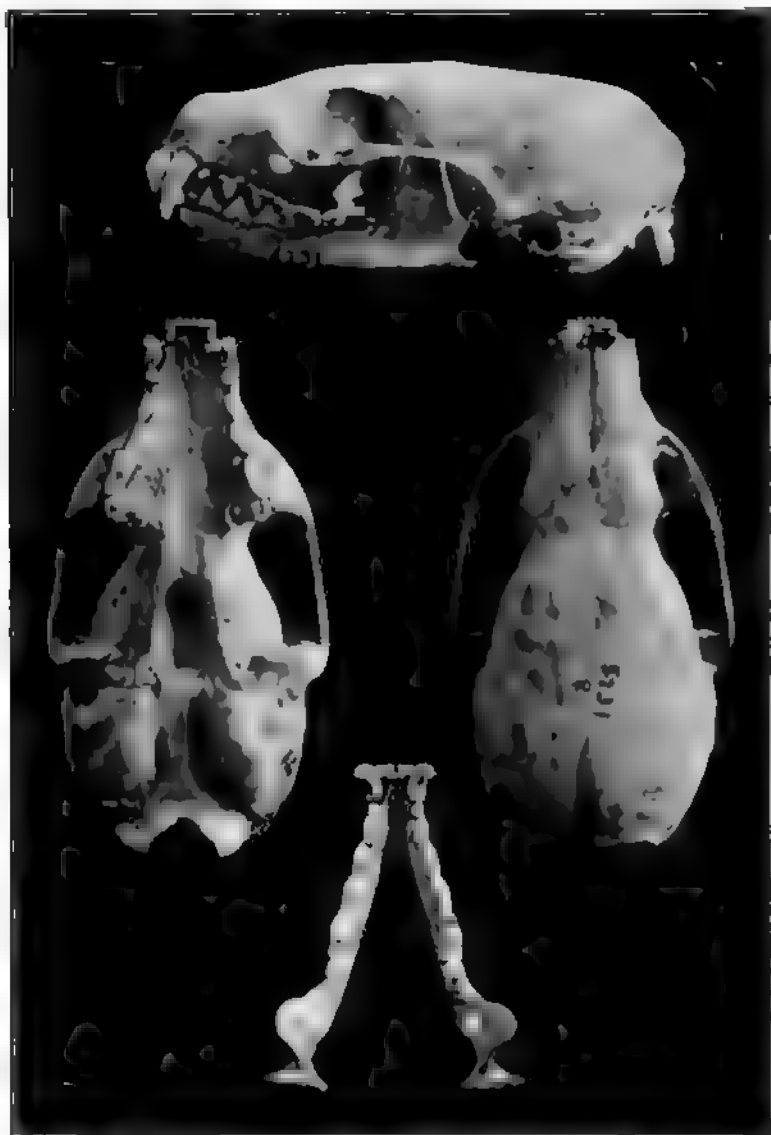


FIG. 66. *MUSTELA AMERICANA*.
No. 8231 Field Columbian Museum Coll. Nat. size.

499. *americana*. (*Mustela*), Turton, Syst. Nat., 1, 1806, p. 60.
martes, Forst. Phil. Trans., 1772, p. 372.
vulpina, Rafin. Am. Journ. Sci., 1819, 1, p. 82. Upper Missouri.

leucopus, Kuhl, Beitr., 1820, p. 74.

huro, F. Cuv. Dict. Sci. Nat., 1823, p. 256.

zibellina, Pall. Zool. Ross. Asiat., 1831, 1, p. 82.

Type locality. Upper Missouri?

Geogr. Distr. Boreal North America west to Rocky Mountains, south to New York.

Genl. Char. Tail half the length of body, bushy; ears large, broad; soles of feet hidden in hair; body long, legs short. Skull long and slender, anteorbital constriction considerable; auditory bullæ large; zygomatic arch non-vertical, highest posteriorly. Last molar small; inner cusp of lower second molar wanting or rudimentary.

Color. Head grayish brown, darkest on the nose, which is more of a smoke brown. Throat and spot on breast rich orange. General tint of the body orange brown clouded with black or blackish brown on the back and belly. Legs and feet and upper part of tail black. Under part of tail, save tip, rufous. The color of this species varies greatly, but the above may be regarded as the general style. Claws white.

Measurements. Total length, 465; tail, 136; hind foot, 66. Skull: occipito-nasal length, 66; Hensel, 64; zygomatic width, 34; mastoid breadth, 30; anteorbital width, 13; length of pterygoid fossa; 10.

500. atrata. (*Mustela*), Bangs, Am. Nat., 1897, p. 162.

Type locality. Bay St. George, Newfoundland.

Geogr. Distr. Newfoundland.

Genl. Char. Pelage dark colored. Skull has rostrum narrow; bullæ larger than in *M. americana*; dentition weaker.

Color. "Deep chocolate, becoming black on back, head, arms, legs, rump and tail; a few white hairs scattered along the back; chest and under side of neck irregularly blotched with orange; a median line of orange on belly; ears black, narrowly bordered all around with dull white; a patch of yellowish white hairs in front of opening of ear."

Measurements. "Total length, 548; tail vertebræ, 185; hind foot, 89; ear from notch, 43. Skull: basilar length, 69.2; zygomatic breadth, 42; mastoid breadth, 34.2; across roots of canine teeth, 14.2; length of mandible, 49.6." (Bangs, l. c.)

a.—caurina. (*Mustela*), Merr., N. Am. Faun., No. 4, 1890, p. 27.

Type locality. Gray's Harbor, Chehalis County, Washington.

Geogr. Distr. Northwest coast of California to Puget Sound, possibly farther north.

Genl. Char. Color of pelage similar to *M. americana*. Skull is

broader and shorter; audital bullæ shorter and less inflated, frontals broader; shelf of palate less produced behind plane of last molar; first upper premolar smaller and more crowded; upper molars larger; upper sectorial larger, with inner lobe larger and longer, projecting anteriorly beyond the plane of the anterior lobe; lower sectorial has inner cusp wanting. All these as compared with *M. americana*. Other minute variations in size of remaining teeth also exist.

Color. Like *M. americana*, the chief difference being that the irregular markings of the throat and under surface generally are orange red instead of whitish or yellowish.

Measurements. Skull: basilar length, 78; Hensel, 70.7; zygomatic breadth, 44.5; across postorbital processes, 22.5; palatal length, 37.6. (Merr., l. c.)

b.—brumalis. (*Mustela*), Bangs, Am. Nat., 1898, p. 502, fig. p. 503.

Type locality. Okak, Labrador.

Geogr. Distr. North Labrador.

Genl. Char. Skull large, rostrum very short, broad; frontals highly arched, auditory bullæ very large and deep; dentition extremely heavy throughout, the last upper molar in particular being very large; the tooth row a good deal crowded.

Color. No skin obtained.

Measurements. Skull: basilar length of Hensel, 78.6; zygomatic breadth, 51; mastoid breadth, 38.8; interorbital breadth, 19.6; breadth between postorbital processes, 23.8; across canines, 17.2; greatest length of auditory bullæ, 17.2; single half of mandible, 58.4; front of canine to back of last molar (upper jaw alveoli), 30.6. (Bangs, l. c.)

c.—actuosa. Osgood, N. Am. Faun., 1900, No. 19, p. 43.

Type locality. Fort Yukon, Alaska.

Geogr. Distr. Alaska.

Genl. Char. Similar to *M. a. brumalis*, but larger. Skull: audital bullæ large and lengthened; dentition weaker; last upper molar smaller.

Color. Head, cheeks and throat pale grayish white mixed with brown; ears whitish within, brown without; rest of upper parts pale ochraceous buff; shoulders grayish; under parts similar to the upper, chest darker; buffy white spot on breast; legs and feet dark brown; tail brown, darkest at tip.

Measurements. Total length, 665; tail vertebræ, 223; hind foot, 109. Skull: occipito-nasal length, 85; zygomatic breadth, 55; across postorbital processes, 24; palatal length, 44; length of audital bullæ, 19.

501. *pennantii*. (*Mustela*), Erxl., Syst. Regn. Anim., 1777, p. 470.

canadensis, Schreb. Säugth., 1778, p. 492, tab. cxxxiv.

melanorhyncha, Bodd., Elench. Anim., 1784, 1, p. 88.

piscator, Shaw, Gen. Zool. Mamm., 1800, 1, p. 414.

nigra, Turton, Linn., 1806, p. 60.

godmani, Fisch., Syn. Mamm., 1829, p. 217.

Type locality. Boreal America.

Geogr. Distr. North America north of 35° in forest-covered country, save on the Pacific coast from California north, where it is supplanted by *M. p. pacifica*.

Genl. Char. Color dark; feet broad, flat, heavily furred; claws stout, curved acute. Skull large, zygomatic arch low, orbital constriction considerable, palate emarginate.

Color. Variable, but dark. Some specimens are glossy black, including the tail and under parts; others are gray or grayish white on the head and neck, and the base of hairs on the tail dark chestnut; the majority of examples have more or less white on the chin, chest and abdomen.

Measurements. Total length, 920; tail vertebræ, 355; hind foot, 94.

a.—pacifica. (*Mustela*), Rhoads, Journ. Am. Philos. Soc., 1898, p. 435.

Type locality. Lake Kichelos, Kittitass County, Washington.

Geogr. Distr. Pacific slope, California to Alaska.

Genl. Char. Skull very large with relatively long nasals. Posterior upper molar large, with spreading inner lobe much wider longitudinally than outer section of same tooth, the crown suddenly constricted at the middle.

Color. Above, from between eyes to middle back, grizzled, grayish ochraceous heavily lined with black, becoming hazel black on hind back, and dark black on rump, thighs and tail. Whole head behind eyes clove brown basally, strongly grizzled with dirty white. Snout to eyes blackish seal brown. Chin, throat, breast and belly between dark chestnut and hazel, obscured with black. Legs and feet black, the fore legs showing the vandyke brown bases of hairs. Basal half of hairs of anterior back are Prout's brown as contrasted with the hair brown of *M. canadensis* (*M. pennantii*).

Measurements. Type relaxed skin. Total length, 1090; tail, 350. Skull: Hinder end of sagittal crest to front of premaxillæ, 125; zygomatic width, 73; mastoid width, 54; interorbital constriction, 28.5; postorbital constriction, 20; mesial length of nasals, 27. (Rhoads, l. c.)

81. **Putorius.**

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{1-1}{2-2} = 34.$$

Putorius. Cuv., Règn. Anim., 1817, 1, p. 147.

Arctogale. Kaup (nec Peters), Entw.-Gesch. und Naturl. Syst. der Europ. Thierw., 1829, p. 30.

Ictis. Kaup, Entw.-Gesch. und Naturl. Syst. der Europ. Thierw., 1829, p. 40.

Gale. Wagn., Suppl. Schreb. Säugth., 1841, 11, p. 234.

Lutreola. Schinz, Syn. Mamm., 1845, 1, p. 346.

Neogale. Gray, Proc. Zool. Soc., 1865, p. 114.

Vison. Gray, Proc. Zool. Soc., 1865, p. 115.

Cynomyonax. Coues, Fur.Bear. Anim., 1877, p. 147.

Size medium, to smallest carnivorous animal (*P. rixosus*). Body very slender; legs short; tail long, bushy or close haired, terminating in a pencil; ears large; soles haired; lower sectorial without inner cusp; anteorbital foramen small, opening over last premolar; rostrum short, vertically truncated; nasals widening from their base anteriorly; bullæ flat; zygomatic arch not usually elevated posteriorly. Females much smaller than the males.

A. Lutreola.

Skull: superior outline rising gradually from nasals to occiput; audital bullæ flattened, the meatus tubular; width of anteorbital constriction and that of nasals about equal. Cusps of molars and premolars well developed, uppersectorial has the antero-internal process developed into a cusp, sometimes having two points. Lower sectorial has an interior tubercle rather strongly indicated. Body stouter than the weasel; tail bushy, tapering; ears small.

502. vison. (*Mustela*), Briss., Règn. Anim., 1756, p. 246.

canadensis, Erxl., Syst. Nat., 1777, 1, p. 455.

nigrescens, Aud. & Bach., N. Am. Quad., 1853, 111, p. 104, pl. cxxiv.

Type locality. Canada.

Geogr. Distr. Eastern North America through Canada to Ontario and the Arctic Sea; westward north of Gulf States to the eastern boundaries of Pacific coast.

Genl. Char. Tail about half as long as the body; nearly black; color dark.

Color. Body uniform chestnut brown, with a white spot on the chin and sometimes on chest and abdomen. Tail darker than the body, nearly black.



FIG. 67. PUTORIUS (LUTREOLA) VISON.
No. 8; Field Columbian Museum Coll. Nat. size.

Measurements. Total length, 584; tail vertebrae, 178; hind foot, 64.

a.—lutreocephalus. (*Mustela*), Harlan, Faun Am., 1825, p. 63.

Type locality. Maryland.

Geogr. Distr. Maine to North Carolina, confined to the sea coast in New England.

Genl. Char. Long and heavily built; coat long and coarse.

Color. Uniform dark chestnut brown, the tail darker. Chin and usually some spots on chest and belly white.

Measurements. Total length, 640; tail vertebræ, 214; hind foot, 75.

b.—vulgivagus. (*Mustela*), Bangs, Proc. Bost. Soc. Nat. Hist., 1895, p. 539.

Type locality. Burbridge, Louisiana.

Geogr. Distr. Shores of Gulf of Mexico from Texas to Florida, and probably the Atlantic coast of South Carolina and Georgia. (Bangs.)

Genl. Char. Superior outline of skull arched; audital bullæ large and somewhat inflated. Dentition heavy, with last molar larger than that of *P. vison*.

Color. Light lustrous brown; end of tail darker. Chin, spot on throat and some hairs on belly white.

Measurements. Type. Total length, 567; tail vertebræ, 173; hind foot, 71. (Bangs, l. c.)

c.—energumenus. (*Mustela*), Bangs, Proc. Bost. Soc., 1896, p. 5, pl. 11, fig. 3.

Type locality. Sumas, British Columbia.

Geogr. Distr. Pacific coast from northern California to Alaska.

Genl. Char. Size large, color dark. Skull large, broad across mastoids; interorbital region well arched; audital bullæ very deep.

Color. Uniform dark sooty brown, becoming black on the tail. Chin white.

Measurements. Type. Total length, 600; tail vertebræ, 205; hind foot, 72. (Bangs, l. c.)

d.—ingens. Osgood, N. Am. Faun., 1900, No. 19, p. 42.

Type locality. Fort Yukon, Alaska.

Geogr. Distr. Yukon region, Alaska.

Genl. Char. Size large; similar to *L. v. energumenus*, but paler.

Color. Paler hues of *L. v. energumenus*.

Measurements. Total length, 720; tail vertebræ, 180; hind foot, 75. (Osgood, l. c.)

503. *lutensis.* (*Mustela*), Bangs, Proc. Bost. Soc. Nat. Hist, 1898, p. 229.

Type locality. Matanzas Inlet, Florida.

Geogr. Distr. South Atlantic States, South Carolina to Florida.

Genl. Char. Size small; hind foot large; skull long and slender with long narrow rostrum and frontals; zygoma slender, close to the skull and slanting backwards from the rostrum; dentition very heavy and strong.

Color. Russet or yellowish clay color, usually some irregular white markings on chin and under parts; tail gradually darkening towards tip to dark reddish brown.

Measurements. Type. Total length, 574; tail vertebræ, 197; hind foot, 68. Skull: basal length, 53.6; zygomatic breadth, 31.6; mastoid breadth, 27.2; interorbital width, 12.8; behind postorbital processes, 11; across postorbital processes, 14; postorbital process to end of nasals, 18. Single half of mandible, 34.8. (Bangs, l. c.)

B. *Cynomyonax*.

Skull: width of interorbital constriction less than that of the nasals; postorbital processes well developed; pterygoids without hamular processes; bullæ inflated but with hardly any tubular prolongation. Size of body large; tail one-third length of head and body.

504. nigripes. (*Putorius*), Aud. & Bach. *Quadr. N. Am.*, 11, 1851, p. 297, pl. 93.

Type locality. Platte River, Nebraska.

Geogr. Distr. Kansas to Montana and North Dakota east of Rocky Mountains.

Genl. Char. Forehead broad, arched; muzzle short; ear short, broad at base, triangular, closely furred; feet covered with hair above and beneath.

Color. Hairs white at roots, bases of longer hairs with a yellowish tinge, the ends broadly reddish brown; under fur white tinged yellow, giving the back a yellowish brown appearance, in some parts approaching rufous; sides and rump lighter, fading to yellowish white. Nose, ears, sides of head, throat and under surface of neck, belly, and under surface of tail, white; chest between fore legs brownish. Broad black patch on forehead, enclosing eyes and reaching near tip of nose; legs to near shoulders and hips brownish black; end of tail black for about two inches. (Aud. & Bach., l. c.)

Measurements. Total length, 485; tail vertebræ, 133; hind foot, 60. Skull: basal length, 64; Hensel, 62.5; breadth of zygoma, 43; of



FIG 68. PUTORIUS (CYNOMYS) NIGRIPES.
No. 1203 Am. Mus. Nat. Hist. Coll. Nat. size.

mastoids, 37; across postorbital processes, 22.5; interorbital width, 18; constriction width, 12.5; palatal length, 33.

O. Arctogale.

Body slender, attenuate; neck long; ears large; tail slender, terete; limbs short; toes separate. Skull: frontal profile arched; moderate interorbital constriction; postorbital processes slightly developed; pterygoids with or without hamular processes.

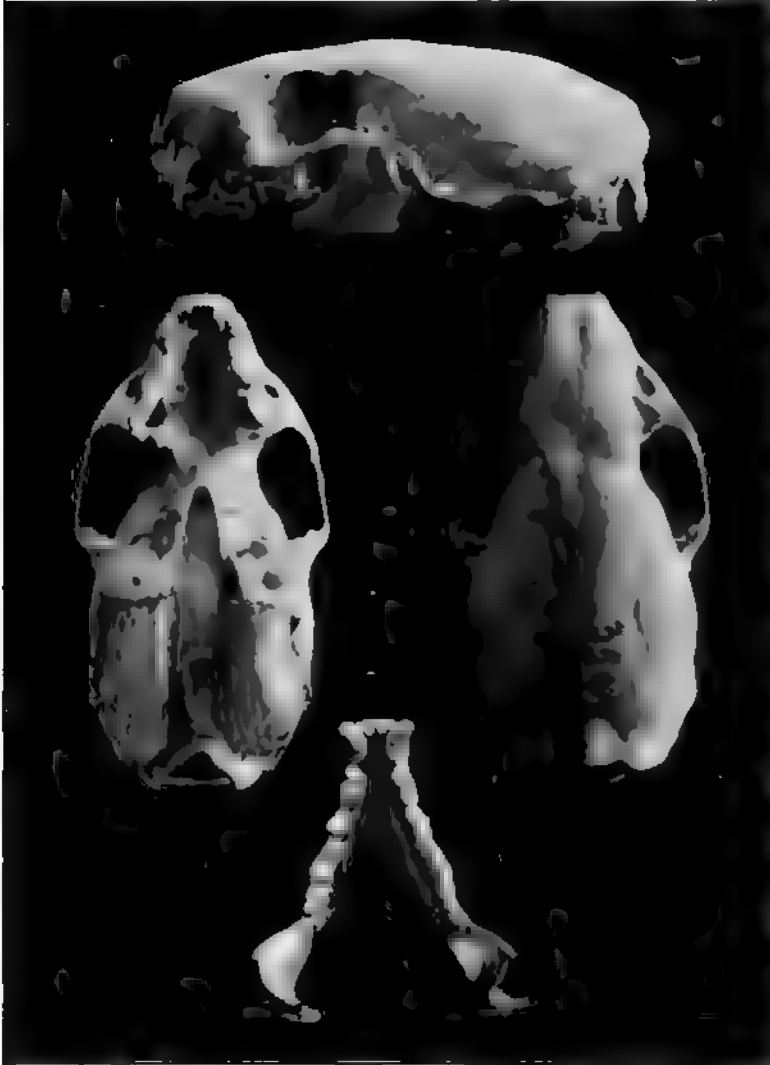


FIG. 69. PUTORIUS (ARCTOGALE) CICOGNANI.
No. 3533 Field Columbian Museum Coll. Enlarged $\frac{1}{2}$.

505. *cicognani*. (*Mustela*), Bon. Iconog. Faun. Ital., 1838, 1, fasc. xxii, p. 4.

vulgaris, Rich. Faun. Bor. Amer. Mamm., 1829, pp. 45-46. (nec Briss.)

Type locality. Carlton House? Arctic America.

Geogr. Distr. Boreal forest covered parts of North America, from New England and Labrador to coast of southeastern Alaska. (Juneau, Wrangel and Loring), and south in the Rocky Mountains to Colorado (Silverton). Interior of British Columbia (Sicamous), but in the Puget Sound region is replaced by a smaller and darker form, *P. stricatori*. In the United States it is common in New England and New York, and in the forest covered parts of Minnesota. Probably occurs also in northern Michigan and Wisconsin. (Merriam.)

Genl. Char. Small, tail short. Skull: light, elongated; zygoma narrow, not outward bowed; audital bullæ small; squamosals inflated.

Color. In Summer. Uniform dark brown except upper lips and under parts, which are yellowish white. Tail tipped with black.

Winter Pelage. Pure white, rump, tail and under parts tinged with yellow. Tip of tail black.

Measurements. Total length, 278; tail vertebræ, 80; hind foot, 36.5.

a.—*richardsoni*. (*Mustela*), Bon. in Charlesw. Mag. Nat. Hist., vol. xi, p. 31, 1838.

Type locality. Fort Franklin, Great Bear Lake.

Geogr. Distr. Hudson Bay to interior of Alaska and British Columbia.

Genl. Char. Size larger than *P. cicognani*; tail with terminal third black. Skull: frontals narrow, zygoma compressed.

Color. Dark chestnut above, the same hue extending over legs and feet between thighs and tail. Rest of body white, tinged with light yellow.

Measurements. Total length, 390; tail vertebræ, 95; hind foot, 45.

b.—*alascensis*. (*Putorius*), Merr., N. Am. Faun., No. 11, p. 12, pl. 11, fig. 2.

Type locality. Juneau, Alaska.

Geogr. Distr. Alaska; range not known.

Genl. Char. White tips to fore and hind feet more extensive. Skull: orbital region broad; constriction great; postorbital processes well developed.

Color. Upper parts and legs chocolate brown; fore feet to wrists and hind feet to middle of upper side, upper lip and under parts of body white; terminal third of tail black.

Winter Pelage. White, except end of tail which is black.

Measurements. Total length, 335; tail vertebræ, 95; hind foot, 48.

506. streator. (*Putorius*), Merr., N. Am. Faun., No. 11, 1896, p. 13.

Type locality. Mount Vernon, Skagit Valley, Washington.

Geogr. Distr. Coast region of Oregon and Washington to Puget Sound.

Genl. Char. Like *P. cicognani*, but smaller and darker; white on belly restricted.

Color. Upper parts dark chocolate brown, as are also the upper lip and feet; the head darkest in hue. This color trespasses on under parts leaving a narrow, irregular portion white.

Measurements. Total length, 270; tail vertebræ, 83; hind foot, 38.

507. rixosus. (*Putorius*), Bangs, Proc. Biol. Soc. Wash., 1896, pp. 21, 22.

pusillus, Baird, N. Am. Mamm., 1857, pp. 159, 161. (Part.)

Type locality. Osler, Saskatchewan, Canada.

Geogr. Distr. Hudson Bay to coast of Alaska; northern Minnesota to Montana.

Genl. Char. Smallest of the Weasels, tail without black tip.

Color. Above dark reddish brown, under parts white. Tail like body.

Winter Pelage. White.

Measurements. Total length, 150; tail vertebræ, 31; hind foot, 22.

a.—eskimo. (*Putorius*), Stone, Proc. Acad. Nat. Scien., Phil., 1900, p. 44.

Type locality. Point Barrow, Alaska.

Geogr. Distr. Northwestern Alaska, limits of range unknown.

Genl. Char. Size small, larger than *P. rixosus*, tail shorter; feet larger.

Color. Brown with a reddish tinge; intermediate between Prout's and walnut brown.

Measurements. Total length, 178-230; tail, 22-31; hind foot, 16-23. Skull: basal length, 29-35; mastoid breadth, 15.4-17; breadth of postorbital processes, 9.3-11; orbital breadth, 8-9; palatal length, 12.1-14.4.

508. arcticus. (*Putorius*), Merr., N. Am. Faun., No. 11, 1896, p. 15.

Type locality. Point Barrow, Alaska.

Geogr. Distr. Arctic coast and Tundras.

Genl. Char. Size large, ear small; terminal half of tail black. Skull broad and massive; postorbital constriction considerable; post-

glenoid space small and hardly inflated in male, brain case subtriangular, short.

Color. Upper parts and upper lip dark, yellowish brown; chin white; under parts, inner and posterior sides of fore legs, all of fore feet, distal half and inner sides of hind feet, and under side of tail deep ochraceous yellow. Terminal half of tail black. (Merr., l. c.)

Measurements. Type. Total length, 380; tail vertebræ, 75; pencil, 55; hind foot, 48.

a.—kadiacensis. (*Putorius*), Merr., N. Am. Faun., No. 11, 1896, p. 16.

Type locality. Kadiak Island, Alaska.

Geogr. Distr. Only known from type locality.

Genl. Char. Smaller than *P. arcticus*; smaller and narrower audital bullæ, less spreading zygomata, less divergent tooth rows, and decidedly shorter postmolar production of palate.

Color. Summer Pelage. Unknown.

Winter Pelage. Pure white, terminal half of the tail black.

Measurements. Total length, 318; tail vertebræ, 86; hind foot, 44.

509. noveboracensis. (*Putorius*), DeKay, Cat. Mamm. N. Y., 1840, p. 18.

Type locality. New York State.

Geogr. Distr. Maine to North Carolina, west to Illinois.

Genl. Char. Great difference in size of sexes, male large, tail long, terminal third to half, black. Skull: zygoma not bowed outward; postorbital processes moderate; audital bullæ rather narrow, rounded anteriorly.

Color. Summer Pelage. Upper parts, encroaching on belly, fore and hind feet, and anal region dark chocolate brown; under parts white tinged with yellow. Tail like back, terminal third or more black.

Winter Pelage. White, tinged with yellow beneath, end of tail black.

Measurements. Male. Total length, 418; tail vertebræ, 150; hind foot, 50. *Female.* Total length, 298; tail vertebræ, 92; hind foot, 26.

a.—notius. (*Putorius*), Bangs, N. Eng. Zool. Club, 1899, p. 53.

Type locality. Weaverville, Buncombe County, North Carolina.

Geogr. Distr. Eastern middle States.

Genl. Char. Like *P. noveboracensis*, but darker above and yellow below.

Color. Summer Pelage. Upper parts dark chocolate brown; under parts maize yellow; apical half of tail black.

Measurements. Total length (including pencil), 426; tail to end of hairs, 169; pencil, 30. (Bangs, l. c.)

b.—occisor. (*Putorius*), Bangs, Proc. New Eng. Zool. Club, 1899, p. 54.

Type locality. Bucksport, Maine.

Geogr. Distr. New England States, Canada? Limits unknown.

Genl. Char. Size large; tail very long, black tip short. Skull and dentition generally heavier than in *P. noveboracensis*.

Color. Summer Pelage. Unknown.

Winter Pelage. Pure white, pencil black.

Measurements. Total length, 454; tail vertebræ, 175; hind foot 54. (Bangs.)

Dimensions vary considerably among individuals.

510. washingtoni. (*Putorius*), Merr., N. Am. Faun., No. 11, 1896, p. 18.

Type locality. Trout Lake, Base of Mt. Adams, Washington.

Geogr. Distr. Washington, exact range unknown.

Genl. Char. Similar to *P. noveboracensis*, but with longer tail and shorter black tip.

Color. Summer Pelage. Upper parts, including flanks, sides of abdomen, sides and upper parts of fore and hind legs pale chocolate brown; chin white. Under parts and lower portions of fore and hind legs and sides of neck yellow ochre. Tail darker than back, reddish, terminal third black. Fore feet and wrists white. Hind feet dark brown.

Winter Pelage. One style has upper parts uniform drab brown; under parts suffused with yellow. Other style all white, tail, rump and belly strongly tinged with yellow.

Measurements. Total length, 400; tail vertebræ, 180; hind legs, 41; ear, 11.

511. peninsulæ. (*Putorius*), Rhoads, Proc. Acad. Nat. Scien., 1894, pp. 152-155.

Type locality. Hudsons, north of Tarpon Springs, Florida.

Geogr. Distr. Florida Peninsula.

Genl. Char. Size large; bullæ very large; postorbital processes not prominent.

Color. Upper parts dull chocolate brown, head darkest; under parts, fore feet and hind toes yellowish. Lip and chin whitish; brown spot at corners of mouth and tuft of white hairs under ear.

Measurements. Total length, 374; tail vertebræ, 127; hind foot, 44.5.

512. longicaudus. (*Mustela*), Bon. Charlsw. Mag. Nat. Hist., N. S., 1838, pp. 37, 38.

erminea, Rich. Faun. Bor. Am., 1829, pp. 46-47. (Part.)

Type locality. Carlton House, North Saskatchewan River, Canada.

Geogr. Distr. Great Plains, Kansas, northward.

Genl. Char. Size large, tail very long. Skull compared with those of *P. noveboracensis* and *P. washingtoni* is broader and shorter, with the zygomatic arch more spreading; postorbital processes longer; postorbital constriction deeper; audital bullæ broader and more rectangular.

Color. Upper parts pale yellowish brown, head darker; chin and upper lip white; under parts, upper side of fore feet, inner side of hind feet and toes buff or ochraceous. Terminal part of tail black, under side yellowish.

Winter Pelage. White.

Measurements. Total length, 450; tail vertebræ, 165; hind foot, 51.

a.—oribasus. (*Putorius*), Bangs, N. Eng. Zool. Club, 1899, 1, p. 81.

Type locality. Kettle River, British Columbia.

Genl. Char. Like *P. longicaudus*, but darker brown above.

Color. Above bister, darkest on head; upper lip and chin white. under parts, inside of legs, both fore and hind, buff yellow; feet above whitish; tail beneath for two-thirds its length buff yellow, tip black.

Measurements. Female. Total length, 302; tail vertebræ, 150; hind foot, 46.

513. spadix. (*Putorius*), Bangs, Proc. Biol. Soc. Wash., 1896, pp. 8, 9.

Type locality. Fort Snelling, Minneapolis, Minnesota.

Geogr. Distr. Minnesota, exact limits unknown.

Genl. Char. Like *P. longicaudus*, but darker colored.

Color. Summer Pelage. Upper parts chocolate brown, head darker; chin and upper lip white; under parts, inside of legs, feet and toes white tinged with yellow. Tail like neck, tip black.

Winter Pelage. Pure white.

Measurements. Total length, 450; tail vertebræ, 171; hind foot, 54. Female much smaller.

514. saturatus. (*Putorius*), Merr., N. Am. Faun., No. 11, 1896, p. 21.

Type locality. Siskiyou, Oregon.

Geogr. Distr. Oregon, Washington and part of British Columbia, in Cascade and Siskiyou Mountains.

Genl. Char. Similar to *P. arizonensis*, but larger and darker, distinct spots behind corners of the mouth.

Color. Summer Pelage. Upper parts dark raw umber brown, darkest on head; terminal part of tail black; brown spot at corner of mouth; outer side of forearm to wrist, and hind foot to toes like back. Chin white. Under parts orange yellow, including fore feet and under side of hind leg to ankle; under side of tail golden chestnut. Anal region chestnut brown.

Winter Pelage. White.

Measurements. Total length, 423; tail vertebræ, 164; hind foot, 48.

515. arizonensis. (*Putorius*), Mearns, Bull. Am. Mus. Nat. Hist., 1891, pp. 234, 235.

Type locality. San Francisco Forest, near Flagstaff, Arizona.

Geogr. Distr. Sierra Nevada and Rocky Mountains into British Columbia, not north of Siskiyou Mountains, in Cascade Range.

Genl. Char. Like *P. longicaudus*, but smaller.

Color. Summer Pelage. Upper parts raw umber brown, darker on head; terminal part of tail black; chin and upper lip white; under parts, upper surface of fore feet, inner half of hind feet and the hind toes ochraceous yellow.

Measurements. Type. Total length, 302; tail vertebræ, 109; hind limb, knee joint to end of claws, 56.

516. allenii. (*Putorius*), Merr., N. Am. Faun., No. 11, 1896, p. 24.

Type locality. Custer, Black Hills, South Dakota.

Geogr. Distr. Black Hills, South Dakota.

Genl. Char. Like *P. arizonensis*; upper parts more yellow, audital bullæ flatter.

Color. Upper parts golden brown with an olivaceous tinge, head dark brown; upper lip and chin white; under parts, inner sides of legs, fore feet, hind toes, and under side of tail deep buffy yellow.

Measurements. Type. Total length, 372; tail vertebræ, 137; hind foot, 14.

517. xanthogenys. (*Mustela*), Gray, Ann. Mag. Nat. Hist., 1843, p. 118.

Type locality. Southern California, near San Diego.

Geogr. Distr. Both sides of Sierra Nevada, southern California.

Genl. Char. Size medium, tail long, face with white marks.

Color. Summer Pelage. Upper parts raw umber brown, tinged with golden, head darker; rectangular spot between eyes and broad oblique band between eye and ear whitish; end of tail black; brown spot behind corner of mouth; chin white; under parts, fore feet, inner side, and toes of hind feet ochraceous.

Winter Pelage. Drab brown.

Measurements. Total length, about 402; tail vertebræ, 156; hind foot, 40.5.

a.—oregonensis. (*Putorius*), Merr., N. Am. Faun., No. 11, 1896, p. 25.

Type locality. Grant's Pass, Rogue River Valley, Oregon.

Geogr. Distr. Rogue River Valley, Oregon, limits unknown.

Genl. Char. Similar to *P. xanthogenys*, but longer and darker, face markings restricted.

Color. Winter Pelage. Upper parts pale chocolate brown, slightly darker on head, a small ill-defined patch between eyes, and a narrow vertical bar between eye and ear white; throat white; rest of under parts, including fore feet and inner sides and distal half of hind feet, pale yellowish; terminal one-fifth of tail black, rest like back.

Measurements. Type. Total length, 412; tail vertebræ, 155; hind foot, 44. (Merriam, l. c.)

b.—mundus. (*Putorius*), Bangs, Proc. New Eng. Zool. Club, 1899, p. 56.

Type locality. Point Reyes, Marion County, California.

Geogr. Distr. Northern California.

Genl. Char. Smaller than *P. xanthogenys*, but similar, tail shorter, colors darker.

Color. Winter Pelage. Upper parts dark tawny rust, dusky on head and nose, brown spot at corner of mouth; facial markings as in *P. xanthogenys*, chin and cheeks yellowish white, rest of under parts and upper surface of hands, inner sides of legs, and upper surface of toes deep orange buff.

Summer Pelage. Very similar, but colors all slightly darker and duller, and under parts more inclined, especially along middle of belly, to strong buff yellow.

Measurements. Type. Total length, 368.3; tail vertebræ, 141.3; hind foot, 42.85. Spec. from Nicasio, Calif. Total length, 384; tail vertebræ, 140; hind foot, 43. (Bangs, l. c.)

518. frenatus. (*Mustela*), Licht., Darstell, neuer od. wen. bekannt. Säugeth., 1832, pl. xlii.

Type locality. Valley of Mexico, near City of Mexico.

Geogr. Distr. Southern Texas into Mexico.

Genl. Char. Size large; tail long; head more or less black with white markings. Skull larger and massive; bullæ obliquely truncated anteriorly; postorbital constriction marked.

Color. Band between eye and ear and patch between eyes white. Top of head from dark chestnut brown to black; rest of

upper parts rich brown, chin and throat whitish, rest of under parts varying from ochraceous yellow to orange; front feet to above wrists from whitish yellow to orange; inner sides of hind legs, and hind feet and the toes yellow or orange. The color of feet is almost always the same as the under parts. Tail same colors as back all around, with a short black tip.

Measurements. Total length, male, 455-505; tail vertebræ, 170-203; hind foot, 45-53.

a.—neomexicanus. (*Putorius*), Bart. & Cockerell, Proc. Acad. Nat. Sci. Phila., 1898, p. 188.

Type locality. Shore of Armstrong lake, Mesilla Valley, near the Rio Grande, New Mexico.

Genl. Char. Similar to *P. frenatus*, but paler; white markings on the head more extensive, occipital condyles more produced behind.

Color. Head brownish black, a quadrangular patch between the eyes, joining broad bands between eyes and ears creamy white. The bands grade into the color of the under parts. Face speckled with whitish. Small whitish mark behind ears. Upper parts and limbs pale yellowish ochre; under parts similar, but lighter; tail tinged with reddish, tip black; feet palish.

Measurements. Total length, 500; tail, 205; hind foot, 50.

519. haldarum. (*Putorius*), Preble, Proc. Biol. Soc. Wash., 1898, p. 169.

Type locality. Massett, Queen Charlotte Islands, British Columbia.

Geogr. Distr. Known only from Massett.

Genl. Char. Similar to *P. kadiacensis*, but smaller, more black on tail; skull smaller.

Color. Winter Pelage. White slightly tinged posteriorly and beneath with saffron yellow. Sixty per cent of terminal portion of tail black. Small spots of summer fur just appearing on face, top of head and back, blackish brown.

Measurements. Total length, 275; tail vertebræ, 60; hind foot, 37; pencil of tail, 40. (Preble, l. c.)

Sub. Fam. II. Lutrinae.

Body lengthened, supple; tail long, tapering, depressed, sides rounded; feet short, broad, palmated; digits distinct; center one the longest, claws small. Head broad, muzzle long; soles and palms hairy; eyes and ears small.

82. *Lutra*.

I. $\frac{3-3}{3-3}$; C. $\frac{1-1}{1-1}$; P. $\frac{4-4}{3-3}$; M. $\frac{1-1}{2-2} = 36$.

Lutra. Erxleb. Syst. Regn. Anim., 1777, p. 448. Type *Mustela lutra*. Linn.

Upper molar large quadrate; posterior upper premolar triangular; skull depressed, superior outline nearly straight; rostrum short; hind portion of skull dilated; nostrils large; palate extending beyond molars; hamular processes to pterygoids.

520. canadensis. (*Mustela*), (Schreb), Kerr, Linn. Anim. King., 1, 1792, p. 173.

hudsonica, (Lacép), F. Cuv. Suppl. Buff., 1, 1831, p. 194.

mollis, Aud. & Bach. Quadr., 111, 1853, p. 976, fig. 122.

destructor, Barnst. Canad. Nat., 1863, fig.

Type locality. Unknown.

Geogr. Distr. Eastern North America, north of North Carolina on Atlantic coast.

Genl. Char. Size large; under surface of feet hairy.

Color. Dark liver brown above, pale on the under parts. Under fur lighter. Cheeks, lips, chin and throat, whitish brown.

Measurements. Size very variable. Total length, 966; tail vertebræ, 315; hind foot, 100.

a.—lataxina. (*Lutra*), F. Cuv. Dict. des Scien. Nat. 1823, p. 242.

Type locality. South Carolina.

Geogr. Distr. Eastern North America from North Carolina to Alabama and Mississippi. South of Transition zone northward grading into *L. canadensis*.

Genl. Char. Size small, feet sparsely haired beneath. Skull small, teeth large; postorbital processes weak.

Color. Above dark vandyke brown, tipped on head, neck and shoulders with wood brown; beneath breast to end of tail broccoli brown. Neck and fore neck grayish brown.

Measurements. Total length, 1016; tail vertebræ, 260; hind foot, 115. Skull: occiput to anterior end of maxilla, 100; zygomatic width, 69.5; mastoid width, 65; interorbital constriction, 22.8; postorbital constriction, 20.

b.—vaga. (*Lutra*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 224, fig. p. 225.

Type locality. Mico, Brevard County, Florida.

Geogr. Distr. Eastern Georgia and Florida.

Genl. Char. Size larger than *L. canadensis*; tail longer; color



LUTRA CANADENSIS SONORA.
No. 1937 Am. Mus. Nat. Hist. Coll. ♂ nat. size.

much redder, less blackish; skull larger and broader across mastoids, much more constricted behind postorbital processes.

Color. Lustrous chestnut brown, somewhat paler below; cheeks, lips, chin, throat, and sides of neck grizzled yellowish brown.

Measurements. Type (not in the flesh). Total length, 1285; tail vertebræ, 487; hind foot, 130. Skull, type: basal length, 106.6; zygomatic breadth, 71; mastoid breadth, 71.2; interorbital constriction, 24; greatest constriction, 18.6; across postorbital processes, 35; last upper molar to end of pterygoid process, 29.8; foramen magnum to end of palate, 51.6; single half of mandible length, 74.4. (Bangs, l. c.)

c.—pacifica. (*Lutra*), Rhoads, Trans. Am. Phil. Soc. U. S., 1898, p. 431.

paranensis and atterima, Thomas, P. Z. S., 1889, p. 199.

californica, Baird (nec Gray), N. Am. Mamm., 1857, p. 187.

Type locality. Lake Kichelos, Kittitass County, Washington.

Geogr. Distr. Pacific slopes; California to Alaska.

Genl. Char. Size large; skull very large, teeth comparatively weak, interorbital width nearly $1\frac{1}{2}$ times postorbital constriction. Audital bullæ flattened.

Color. Lighter than *L. canadensis*, and more brownish. Above ruddy seal brown; lower parts lighter; throat, neck and breast pale wood brown. Ventral region very light.

Measurements. Total length, 1115; tail vertebræ, 419; hind foot, 128. Skull: occiput to end of premaxilla, 115.5; zygomatic width, 72.5; mastoid width, 69; interorbital constriction, 25; postorbital constriction, 20.

d.—sonora. (*Lutra*), Rhoads, Proc. Am. Phil. Soc., 1898, p. 431.

canadensis, Mearns, (nec Kerr), Bull. Am. Mus. Nat. Hist., 1891, p. 253.

Type locality. Montezuma Well, Beaver Creek, Yavapai County, Arizona.

Geogr. Distr. Mexico to Wyoming.

Genl. Char. Size large; hind foot long. Postorbital processes of skull attenuated.

Color. Above dark brown, changing to pale grayish brown below, being whitish on under sides of head and neck. The hairs on head and neck above tipped with yellowish brown.

Measurements. Total length, 1300; tail vertebræ, 472; ear, 15.

521. degener. (*Lutra*), Bangs, Proc. Biol. Soc. Wash., 1898, p. 35.

Type locality. Bay St. George, Newfoundland.

Genl. Char. Size small, tail short, skull small and weak with

very light zygoma and narrow frontal and rostral regions. Audital bullæ small.

Color. Deep lustrous seal brown to black all over except cheeks, upper lips, chin and under side of neck, which are grizzled brown, palest on cheeks, under fur light grayish brown at base and gradually darkening to deep rich brown at tips.

Measurements. Total length, 998; tail vertebræ, 358; hind foot, 126. Type young adult male.

83. Latax.

$$I. \frac{3-3}{2-2}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{1-1}{2-2} = 32.$$

Latax. Gloger, Nov. Act., Ac. Caes. Leop. Carol., 1827, pt. 2, p. 511.

Type *M. lutris*, Linn.

Pusa, Oken, Lehrb. Naturg., 1816, Th. 111, p. 986. (nec Scopoli.)

Enhydra, Flem., Phil. Zool., 1822, 11, p. 187. (nec *Enhydris*,

Merrem, Amph., 1820).

Only four incisors in lower jaw; molars massive, cusps rounded smooth; upper molar and posterior upper premolar somewhat oval; anterior lower premolar largest of the lower teeth; skull similar to that of *Lutra*; hind feet larger, flat, fin-like; fifth toe longest, rest diminishing to the first; claws moderate; tail obtuse, one-fourth the length of head and body.

522. lutris. (*Mustela*), Linn. Syst. Nat., 1, 1766, p. 66.

marina, Erxleb. Syst. Regn., 1777, p. 445.

orientalis, Oken, Lehrb. Natur., 1816, 111, p. 986.

stelleri, Less. Man. Mamm., 1827, p. 156.

gracilis, Fisch. Syn. Mamm., 1829, p. 229.

Type locality. "America Septentrionali."

Geogr. Distr. North Pacific, south to California? Nearly extinct on American shores.

Genl. Char. Hind feet very broad, webbed soles furry; fore feet very small, palms naked; tail flattish, smooth, one-fourth length of body. Only four lower incisors.

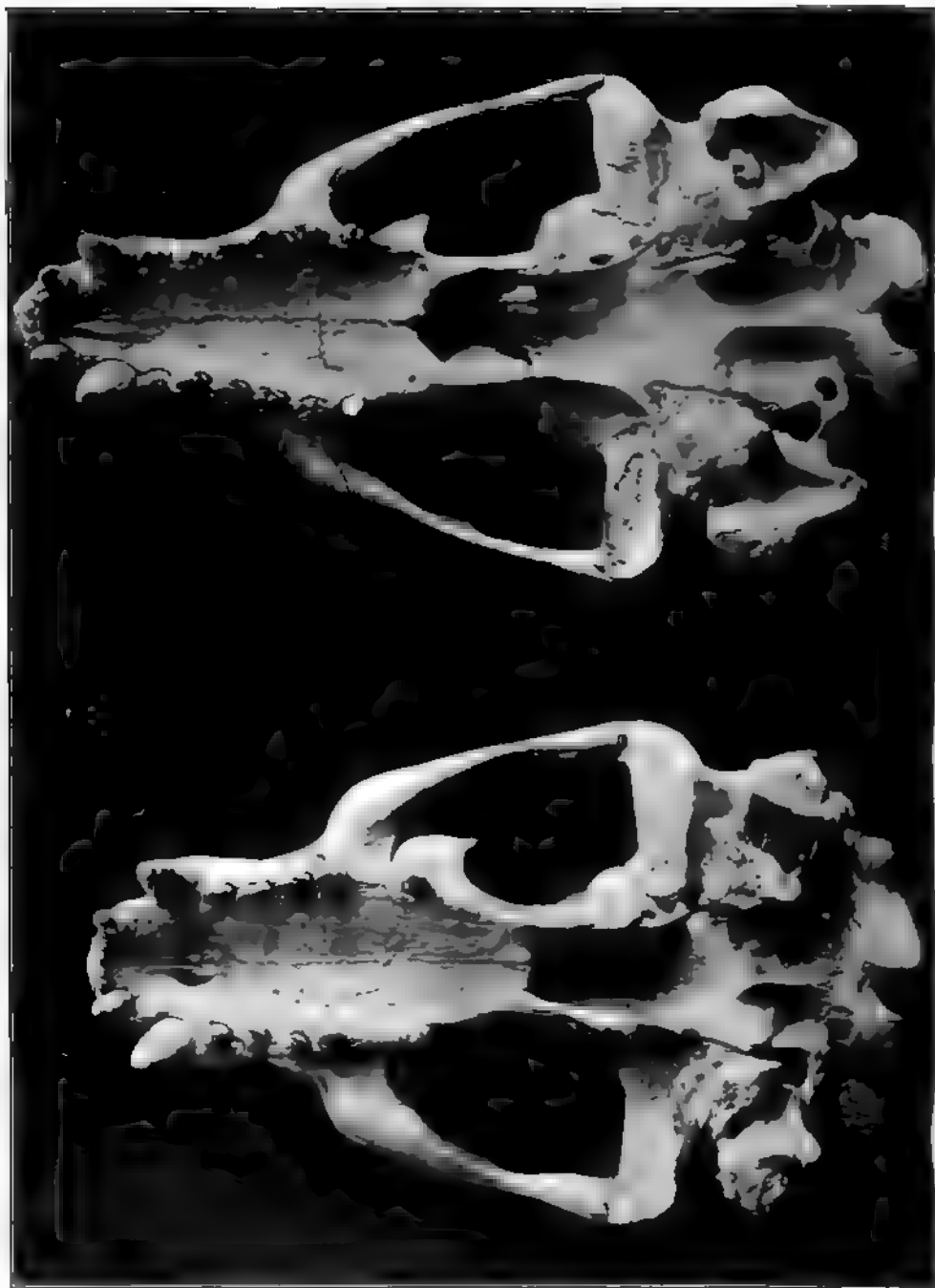
Color. Adult. Black, frosted with white tipped hairs; head and neck grayish white or yellowish white.

Measurements. Total length, about 1050; tail vertebræ, 330; hind foot, 150; width, 100. Skull: occipito-nasal length, 111; Hensel, 109; zygomatic width, 98; interorbital constriction, 28; mastoid breadth, 96; palatal length, 56; length of brain case, 62; length of first lower molar, 15; width, 13; length first upper molar, 7; width, 11.



LATAX LUTRIS.

No. 371 Field Columbian Museum Coll. $\frac{3}{4}$ nat. size



Order VIII. **Pinnipedia.**

J. A. Allen, *History of North American Pinnipeds*, U. S. Geol. and Geog. Surv., 1880.

St. G. Mivart, *Notes on the Pinnipedia*, Proc. Zool. Soc., 1885.

Fam. I. **Otariidae.**

Aquatic carnivora, with the limbs enclosed in the general tegument beyond the knees and elbows. Five digits on each limb, the first and fifth of the hind limbs generally the longest and stoutest, those of the front limbs decreasing in size from first to fifth. Body and neck elongated; fore feet nearly as large as the hind feet; the latter capable of expansion, and with distinct claws on the three middle digits, front feet without claws; tail very short; when walking hind feet are turned forward under the body, supporting it; ears external; interorbital constriction of skull great; facial portion short, rather broad; two central pairs of upper incisors with a transverse groove; postorbital processes developed; alisphenoid canal present. Testes external in scrotum.

84. **Eumetopias.**

$$I. \frac{3-3}{2-2}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{1-1}{1-1} = 34.$$

Eumetopias. Gill, Proc. Essex Institute, 1866, v, p. 7.

Head rounded, nose narrow pointed; eyes large; ears rather long, narrow, pointed; skin of feet extending beyond the nails, the margin lobed; canines large, curved, acute. Palate ends beyond the pterygoid processes, and is nearly flat, emarginate behind; posterior border of nasals extending beyond zygoma; pterygoid processes hook-like; upper molar separated by a wide space from premolars.

A. **Eumetopias.**

Space between upper molars.

523. stelleri. (*Otaria*), Less., Dist. Class., Hist. Nat., 1828, xiii, p. 420.

jubata, Schreb. (nec Forst), Säugth., III, 1778, p. 300.

leonina, Pall., Zoog. Ross. Asiat., I, 1831, p. 104.

californianus, Gray (nec Less), Cat. Seals and Whales, 1866, p. 30, pls. 21, 22.

Type locality. Bay of San Francisco.

Geogr. Distr. North Pacific shores, Bering Straits to California and Japan.

Genl. Char. Skull: brain case subquadrate, abruptly contracted anteriorly, diameter greatest at posterior end of zygoma and there equals three-fifths of its length; postorbital processes strongly developed and quadrate; muzzle broad, its width at canines about one-fourth the length of skull. Fifth pair of molars placed far behind fourth pair. Adult males have high occipital and sagittal crests. Ears short, pointed.

Color. Adult. Bright golden rufous in spring; in the autumn light sepia or vandyke brown, darker on the belly. Limbs dark reddish brown almost black on outside; whiskers white or brownish white; nails bluish horn color. Specimens vary in coloration. Females usually lighter.

Measurements. Total length, male, 2850; tail vertebræ, 100; outstretched fore limbs, 2362; length of hind foot, 559; ear 37. Female much smaller.

85. *Zalophus*.

No space between upper molars.

***Zalophus*.** Gill, Proc. Essex Inst., 1866, p. 7. Type *Artocephalus lobatus*, Gray.

Neophoca. Gray, Ann. & Mag. Nat. Hist., 1866, xviii, p. 231.

524. *californianus*. (*Otaria*), Less., Dict. Class, Hist. Nat., 1828, xiii, p. 420.

gillespii, M'Bain, Proc. Edinb. Roy. Soc., 1, 1858, p. 422.

Type locality. California.

Geogr. Distr. West coast of United States from Bay of San Francisco southward.

Genl. Char. Skull: facial portion elongated, slender; zygomatic breadth more than half the length of skull; postorbital processes long, narrow and directed backwards in old animals. Molars usually closely approximate; sagittal and occipital crests highly developed.

Color. This varies greatly among individuals, and at different seasons from yellow and brownish yellow to reddish and blackish brown. Limbs blackish brown as also the belly. After moulting the pelage is golden brown. Whiskers yellowish white.

Measurements. Total length, males, 2160; to outstretched hind flippers, 2542; fore feet, 369; hind foot, 380; tail 110; ear, 35; longest whisker, 225. Female much smaller.



CALLOTARIA URSINA.

No. 1546 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.

86. Callotaria.

I. $\frac{3-3}{2-2}$; C. $\frac{1-1}{1-1}$; M. $\frac{5-5}{5-5}$ or $\frac{6-6}{5-5} = 34$ or 36.

Callotaria. Palmer, Proc. Biol. Soc. Wash., 1892, p. 156. Type *Phoca Ursina*, Linn.

Callorhinus. Gray, Proc. Zool. Soc., 1839, p. 359. (nec Blanchard Entom. nec Girard, Herpet.)

Arctocephalus. Gill (nec F. Cuv.), Proc. Essex Inst., 1866, pp. 7-11.

Facial portion of skull short, convex; nasals short, narrow posteriorly; palate narrow, contracted posteriorly, the arch deep, concave. Dentition weak.

525. ursina. (*Phoca*), Linn., Syst. Nat., 1, 1758, p. 37.

krachenninikowi, Less., Class., 1828, xiii, p. 420.

nigra, Pall., Zoog. Rosso-Asiat., 1831, 1, p. 107. (juv.)

monteriensis, Gray, Proc. Zool. Soc., 1857, p. 360. (Part.)

Type locality. Bering Sea Islands.

Geogr. Distr. Pacific shores of the United States from California northward; Pribyloff Islands, Bering Sea; also islands and shores of the Asiatic coast of north Pacific Ocean.

Genl. Char. Pelage consists of a dense, fine silky fur, with a covering of long, moderately coarse hair. Skull: facial portion short, broad and elevated; postorbital processes subquadrate to sub-triangular, postorbital constriction very considerable; sagittal and occipital crests well developed. Dentition weak. Ears long, narrow and pointed.

Color. This varies from rich chestnut brown to black in the male, sometimes grayish black, but specimens exhibit great variety of hues. Naked skin of limbs, nose and anal region black. Females are much lighter, exhibiting various shades of gray, with rufous on breast and belly. Whiskers are black in the young, white in adult.

Measurements. Total length, male, 2360; tail vertebræ, 50; outstretched hind limbs, 2472; ear, 50; longest whisker, 180. Female, total length, 1170; tail vertebræ, 50; nose to end of hind limbs, 1750; longest whisker, 140.

Fam. II. Trichecidae.

External ears wanting. Body large, unwieldy, gross; skull swollen anteriorly; upper canines immensely developed descending far below the lower jaw, tusk-like; postorbital processes wanting; alisphenoid canal present. Hind feet employed in walking similarly as do the members of the *Otariidae*.

87. *Trichechus*.

$$I. \frac{1-1}{0-0}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{0-0}{0-0} = 18.$$

Trichechus. Linn., Syst. Nat., 1766, 1, p. 49. Type *T. rosmarus*.

Muzzle broad, short, with a group of stiff, bristle-like whiskers on each side; fore feet with five subequal toes each having a flat small nail; hind feet with the fifth toe longest; skin projecting beyond the nails; small flat nails on first and fifth toes, long, pointed nails on remaining three. Tail rudimentary.

526. rosmarus. (*Trichechus*), Linn. Syst. Nat., 1, 1766, p. 49.

Geogr. Distr. Coast of Labrador northward into the Arctic Ocean, and along the shores of Greenland, boreal islands and polar areas of eastern hemisphere to western Asia.

Genl. Char. Head small, square, longer than broad; muzzle abruptly truncated; lower jaw pointed; body thick, heavy; tusks long; anterior profile from nasals to point oblique; interorbital constriction moderate; zygoma moderately heavy; inferior border of ramus a gradual nearly uniform curve from posterior end of symphysis to end of jaw.

Color. Yellowish brown; belly and base of flippers reddish brown or chestnut. Bristles yellowish horn color.

Measurements. Total length, 2450-3650; manus from carpal joint to end of digits, 355-400; pes, from tarsal joint to end of longest digit, 380-450; transverse diameter of tarsus, 178. Length of tusk about 305 outside lips.

527. obesus. (*Trichechus*), Illig. Abhandl. d. Berl. Acad. (1804-11), 1815, pp. 68, 70, 75.

rosmarus, Shaw, Gen. Zool., 1, 1800, p. 234, fig. 68. (Part.)

divergens, Illig. Abhandl. d. Berl. Akad. (1804-11), 1815, p. 68.

cookii, Fremery, Bijdrag, tot de naturk. Wetensch., vi., 1831, p. 385.

arcticus, Pall. Zool. Rosso-Asiat., 1831, p. 269, pls. xxviii, xxix.

Geogr. Distr. Northwest coast of America, in Arctic Sea and Bering Straits, and certain islands in Bering Sea, in Kotzebue and Norton Sounds, and Bristol Bay; also on northeastern coast of Asia.

Genl. Char. Skull: muzzle narrower than that of *T. rosmarus*, with the occipital region wider and more massive; tusks longer and thicker, less incurved and more divergent; interorbital constriction very marked; zygoma heavy; interior border of ramus bluntly rounded.

Color. Yellowish brown, dark beneath. There is very little dif-



TRICHECHUS ROSMARUS.

No. 41 Field Columbian Museum Coll. $\frac{1}{2}$ nat. size.



MACRORHYNUS ANGUSTIROSTRUS.

No. 21887 U. S. Nat'l Museum Coll. ♀ nat. size.



MACRORHINUS ANGUSTIROSTRUS.

No. 21887 U. S. Nat'l Museum Coll. $\frac{3}{4}$ nat. size.

ference in the color of the Atlantic and Pacific Walrus. Bristles "short, stubbed, grayish white."

Measurements. *Male*, total length, about 3350; weight, about 2,000 lbs.

Fam. III. **Phocidae.**

Neck short; hind limbs useless for terrestrial progression; palms and soles of feet hairy; no external ear; testes abdominal, no scrotum; skull without postorbital processes and no alisphenoid canal; auditory bullæ inflated. Five developed claws on each foot, those of hind feet subequal, the first and fifth not greatly exceeding the others in length; not extending beyond toes.

Sub. Fam. I. **Cystophorinae.**

88. **Macrorhinus.**

$$I. \frac{2-2}{1-1}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{1-1}{1-1} = 30.$$

Macrorhinus. F. Cuv. Mém. du Mus., 1824, xl, p. 200, pl. xiii.

Type *Phoca leonina*. Linn.

Mirounga. Gray, Griff. Anim. King., 1827, v, p. 179. (Part.)

Rhinophora. Wagl. Nat. Syst. Amph., 1830, p. 27.

Morunga. Gray, List. Ost. Spec. Brit. Mus., 1847, p. 33.

Teeth small, one rooted; hind feet without nails; nose of adult male elongated into a tubular proboscis, capable of dilatation and extension; palate short, emarginate.

528. angustirostris. (*Macrorhinus*), Gill, Proc. Chicago Acad. Scien., 1866, p. 331.

Type locality. St. Bartholomew's Bay, Lower California.

Geogr. Distr. Cape Lazaro to Point Reyes, coast of California. Now practically extinct.

Genl. Char. Superior outline of skull irregularly arched from the lambdoidal suture to end of the nasals. Snout of male lengthened, narrowed at end, widest behind last molar and equal to three times and a half the total length of skull. Squamosal truncated above the meatus auditorius. Palatines short, the posterior sinus semi-oval, the bottom being about midway between the snout and the line of the jugular foramina. Maxillaries deeply incurved, line of molars incurved. Group of bristles over each eye. Hind flippers emarginate, hairy without nails.

Color. Light brown generally, becoming bluish after the hair is shed.

Measurements. Total length, *Male*, 18-20 feet. *Female*, total



CYSTOPHORA CRISTATA.

No. 952 Am. Mus. Nat. Hist. N. Y. Coll. X nat. size.



MALICOMERUS GRYPUS.

Nat. size. Am. Mus. Nat. Hist. 1891. 1/2 nat. size.

PHOCA (ERIGNATHUS) BARBATA.

Nat. size. Am. Mus. Nat. Hist. 1891.

Sub. Fam. II. **Phocinae.****90. Halichoerus.**

$$I. \frac{3-3}{2-2}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{1-1}{1-1} = 34.$$

Halichoerus. Nills, Faun. Skand. 1820, 1, p. 377. Type *Phoca grypus*. Fabr.

Pusa. Gill, (nec Scopoli, 1777), Johns. New. Univ. Cycl., 1877, 111, p. 1226.

Molars, excepting occasionally the two hinder in lower jaw, without accessory cusps; all one-rooted except last two above and last one below. Muzzle broad; superior outline of skull much arched; facial portion broad, nearly half as long as skull; brain case small; orbital fossæ large; sagittal and occipital crests very greatly developed in old males.

530. grypus. (*Phoca*), Fabr. Skriv. af Nurturh.-Selsk., 1, 2, 1791, pl. xiii, fig. 4.

Geogr. Distr. North Atlantic from Nova Scotia to Greenland.

Genl. Char. Those of the genus.

Color. Silver ash or dusky gray, spotted obscurely with blackish; color varies from uniform silvery to blackish. Bristles, large, stiff.

Measurements. Total length adult male, 2440–2745; female, 1980–2135.

91. Phoca.

$$I. \frac{3-3}{2-2}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{1-1}{1-1} = 34.$$

Phoca. Linn. Syst. Nat., 1758, 1, p. 37. Type *P. vitulina*.

Pusa. Scop. Intr. Hist. Nat., 1777, p. 490.

Calocephalus. F. Cuv. Dict. Scien. Nat. 1826, xxxix, p. 544.

Pagophilus. Gray, Zool. Erebus and Terror, 1844, p. 3.

Pagomys. Gray, Proc. Zool. Soc., 1864, p. 28.

Erignathus. Gill, Proc. Essex Inst., 1865, p. 5.

Haliphilus. Gray, Ann. and Mag. Nat. Hist., 1866, xvii, p. 446.

Histriophoca. Gill, Am. Nat., 1873, vii, p. 179.

Incisors simple, conical; molars, excepting the anterior one, two-rooted, and generally tri-lobed, and with accessory cusps; all feet with five strong compressed slightly curved claws; first and second digits on fore feet subequal. Facial portion of skull narrow, lengthened; interorbital constriction considerable.

A. Erignathus.

Muzzle broad, cranium at anterior border of frontals very high; palate very broad, arched, outline elliptical; narial fossæ deep. Teeth small, weak; molars separate, some deciduous in old adults.

531. barbata. (*Phoca*), Fabricius, Muller's Zool. Dan. Prod., 1776, viii.

leporina, Lepech. Act. Ac. Petrop., 1, 1777, p. 264, pls. 8, 9 (juv).

parsoni, Less. Dict. Class., 1828, xiii, p. 414.

lepechini, Less. Dict. Class., 1828, xiii, p. 415.

nautica, Pall. Rosso Asiat., 1831, p. 108.

albigena, Pall. Rosso-Asiat., 1831, p. 109.

nautica, Gray, Cat. Seals and Whales, 1871, p. 3.

Type locality. Coast of Cornwall, England.

Geogr. Distr. Circumpolar, boreal, south in North American seas to Newfoundland.

Genl. Char. Body long, slender. Skull: orbital fossæ small, as are also the auditory bullæ; lower jaw small and weak; process on posterior border beneath condyle, transverse to longitudinal axis. Bones of skeleton light and porous.

Color. Above gray, darker on middle of back; color, however, varies greatly. Some are gray without spots, others spotted with yellowish.

Measurements. Total length about 3050; skeleton adult female, 219.

B. *Histiophoca*.

Skull imperfect, much broken; molars placed apart, crowns simple directed backward. Superior outline of skull apparently nearly straight, flat; zygomatica wide, heavy; bullæ large, widely separated, obliquely placed; basioccipital and basisphenoid wide; pterygoid fossa wide for all its length; palatal arch rounded; palate broad posteriorly, narrowing rapidly anteriorly.

532. lineolata. (*Phoca*), Zimm., Geog. Gesch., 1783, iii, p. 277.

equestris, Pall. Rosso Asiat., 1, 1831, p. 111.

Geogr. Distr. Bering Sea south to the Aleutian Islands, and to the Island of Saghalien on the Asiatic coast.

Genl. Char. Same as those of genus.

Color. Male. Dark brown; yellowish white band around neck to top of head; another broader around hind part of body, with a branch on each side to shoulder, confluent in center of body beneath; posterior part of abdomen spotted with brown.

Female. Grayish yellow or grayish brown, with a narrow obscure whitish band across lower part of back.

Measurements. Total length: Male, 1683; female, 1600. Skull: occipital condyles to alveolus of incisors, 200; length of Hensel, 178;



PUPA (METEOROLOGICAL STATION).



PHOCA (HISTRIOPHOCA) FASCIATA.

No. 22995 U. S. Nat'l Mus. Coll. Nearly $\frac{1}{2}$ nat. size.



zygomatic width, 121; palatal length, 72.—Spec. No. 22995, from Cape Prince of Wales, Bering Strait, Coll. U. S. Nat. Mus. Washington.

C. *Phoca*.

Skull and dentition heavy, body stout; limbs short. Palate broad, widening anteriorly; zygomata widely spread, curved; bullæ moderate; basioccipital and basisphenoid broad.

533. vitulina. (*Phoca*), Linn. Syst. Nat., 1, 1758, p. 39, 1766, 1, p. 56 (part).

variegata, Nilss. Skand. Faun., 1, 1820, p. 359.

scopulicola, Thienem. Reis. Nord. Eur., 1824, 1, p. 59, pl. v.

littoria, Thienem Reis. Nord. Eur., 1824, 1, p. 59, pl. v.

pealsi, Gill, Proc. Essex Inst., 1866, v, pp. 4, 13.

faetida, Bart. Proc. Zool. Soc., 1868, p. 402.

Type locality. Coast of Europe.

Geogr. Distr. Coasts of North Atlantic and North Pacific Oceans, south to New Jersey and southern California respectively.

Genl. Char. Head large, nose broad, limbs short; dentition heavy, molars close together, obliquely set; superior outline of skull convex; mandible short, heavy, thick, no inward curvature of inferior border. First digit of manus of young slightly the longest. Lower premolars and molars with four cusps; upper end of premaxillæ only touch nasals.

Color. Variable. Above yellowish gray spotted with dark brown or black; beneath yellowish white spotted with dark brown.

Measurements. Total length, about 1225; but dimensions vary greatly.

534. largha. Pall. Zoöl. Rosso-Asiat., 1831, 1, p. 113.

Type locality. Kamtschatka, east shore.

Geogr. Distr. Northern Pacific Ocean, Bering Sea.

Genl. Char. Lower premolars and molars with three cusps instead of four; upper end of premaxillæ continues along sides of nasals for some distance.

Color. Grayish or ashy white spotted with black; spots smallest and closest on dorsal surface; feet brownish, claws black. Young yellow, dark gray on back.

Measurements. Total length, 1220–1730.

D. *Pusa*.

Skull slender, nasals pointed, not prolonged posteriorly; teeth small, separated, pointed; upper molars with usually three cusps,

except the last, which has two. Sometimes, however, all the upper molars have four cusps. First digit of manus longest.

- 535. hispida.** (*Phoca*), Schreb. Säugth., iii, 1776, p. 312, pl. lxxxvi.
faetida, Fabricius, Mull. Zool. Dan. Prod., 1776, viii, desc. null.
anneleta, Nilss. Skand. Faun., 1820, 1, p. 262.
discolor, F. Cuv. Mém. du Mus., 1824, xi, p. 186.
schreberi. et frederici, Less. Dict. Class., d'Hist. Nat., xiii, 1828, pp. 414-416.

dimidiatus, Gray, Cat. Seals and Whales, 1866, p. 22.

Type locality. Greenland.

Geogr. Distr. Circumpolar; south to Labrador on American coast of Atlantic Ocean, and northern shores of Bering Sea on the Pacific coast.

Genl. Char. Size moderate. First digit of manus exceeds all the others in length; teeth small, separated by diastema. Facial portion of skull short, narrow, tapering uniformly. Superior outline of skull flat.

Color. Above blackish brown, darkest on back; sides lighter, with large oval whitish spots; beneath yellowish white. Ring around eye black; bristles blackish. Pattern and coloring varies among individuals.

Measurements. Male. Total length, 1560; female, 1380. Dimensions vary considerably.

E. Pagophilus.

Teeth small, separated; muzzle narrow, lengthened, attenuated; superior outline of skull flat; mandible very slender; rami thin and broad, inferior borders curving inward.

- 536. groenlandica.** (*Phoca*), Fabricius, Mull. Zool. Dan. Proc., 1776, viii.
nigra, Kerr Anim. Kingd., 1792, p. 125.
oceanica, Lepech. At. Acad. Petrop., 1777, 1, p. 295, pls. vii, viii.
semilunaris, Bodd. Elench. Anim., 1785, p. 170.
albicauda, Desm. Mamm. Suppl., 1822, p. 839.
lagura, G. Cuv. Oss. Foss., 1825, v, p. 206 (juv.).
mulleri, desmaresti, et pilayi, Less, Dict. Class. Hist. Nat., 1828, xiii, pp. 413, 416.
dorsata, Pall. Zoog. Rosso-Asiat., 1831, 1, p. 112.
albin, Alex. Mem. Ac. Torino, 1850, 11, p. 141, pls. 1-lv.
annelata, Gaimard (nec Nills), Voy. Isl., Atlas, 1851, pl. xi, fig. 9.
Type locality. Greenland.

Geogr. Distr. Circumpolar; south to Newfoundland in the Atlantic Ocean, and in north Pacific Ocean possibly to Sitka?

Genl. Char. Size large; color varying greatly according to age, female one-fourth less than male.

Color. Male. Whitish or yellowish white; nose and head to behind eyes black, chin and throat black spotted. A broad black band from shoulders along the sides to tail, uniting on back between shoulders and on lower portion of back. Hind limbs black spotted.

Female. Dull white or yellowish, back tawny, and without black markings, or having them very indistinct; individuals vary greatly in color.

Measurements. Total length, 1525—1600.

Order IX. **Insectivora.**

G. E. Dobson, *Monograph of the Insectivora*, 1882.

G. E. Dobson, *Synopsis of the Soricidae*, 1890.

C. H. Merriam, *Revision of the American Genera Blarina & Notiosorex, and Synopsis of the Am. Shrews of the Genus Sorex*, *N. Am. Faun.*, No. 10, 1895.

G. S. Miller, *The Long-Tailed Shrews of the Eastern United States*, *N. Am. Faun.*, No. 10, 1895.

Fam. I. **Soricidae.**

Skull long, narrow; no zygomata or postorbital process; tympanic not forming a bulla. Upper molar cusps with pattern like a W. First upper incisor large and hook-like with basal cusp on posterior border; no cæcum; pubic arch closed; tibia and fibula united. Nose long, overhanging the mouth.

Sub. Fam. I. **Soricinae.**

Summits of teeth colored red.

92. **Sorex.**

$$I. \frac{4-4}{2-2}; C. \frac{1-1}{0-0}; P. \frac{2-2}{1-1}; M. \frac{3-3}{3-3} = 32.$$

Sorex. Linn. Syst. Nat., 1755, p. 53. Type, *S. araneus*, Linn.

Ear conch well developed; tail long; inner side of canines and incisors without secondary cusps; brain case rather broad; mandible fragile; feet without fringe.

537. personatus. (*Sorex*), Geoff. St. Hil. Mem. du Museum, Paris, 1827, vol. xv, 122-125.

fosteri, Rich. Zool. Journ., 1828, 111, p. 516.

cooperi, Bachm. Journ. Acad. Nat. Scien. Phil., 1837, p. 388, pl. xxiv, fig. 7.

fimbripes, Bachm. Journ. Acad. Nat. Scien. Phil., 1837, p. 391, pl. xxiv, fig. 8.

leseueri, (*Amphisorex*), Duvern, Mag. Zool. Mamm., 1842, p. 33 pl. 1.

platyrhynchus, Linsley, Sill. Am. Journ., 1842, p. 346, xliii.

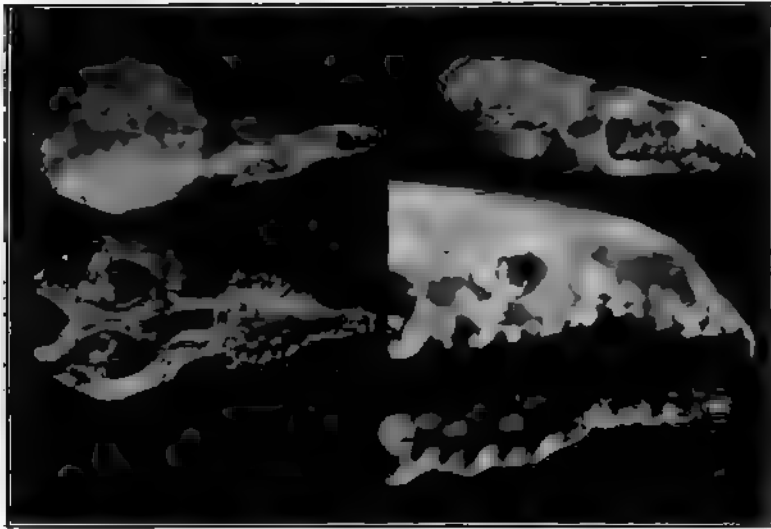


FIG. 70. SOREX MONTEREYENSIS.

No. 221 Field Columbian Museum Coll.

Skull enlarged $2\frac{1}{2}$ times.

Tooth rows enlarged 6 times.

platyrhinus, (*Otisorex*), DeKay, Zool. N. Y., 1842, 1, p. 22, pl. v, fig. 1

haydeni, Baird, Mamm. N. Am., 1857, p. 29.

richardsoni, Dobson, (nec Bach.), Mon. Insectiv. 1890, 1, pt. 111, pl. xxiii, fig. 9.

idahoensis, Merr., N. Am. Faun., No. 5, p. 32.

Type locality. Eastern United States.

Geogr. Distr. New England to Alaska and south in high mountains to Tennessee and North Carolina. Not found in southern Rocky Mountains or Cascade-Sierra ranges.

Genl. Char. Size small; tail shorter than body; anterior part of rostrum compressed, attenuate; unicuspid decreasing from first to fifth.

Color. Above sepia brown mixed with dark tipped hairs; beneath ashy gray; tail above, including tip, dusky, beneath whitish, sometimes there is a chestnut phase of pelage.

Measurements. Total length, 93-106.4; tail vertebræ, 35.3-42.2; hind foot, 11-12.8.

a.—streatori. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 62.

Type locality. Yakutat, Alaska.

Geogr. Distr. Limits of range not known.

Genl. Char. Larger and darker than *S. personatus*; tail about equal to body.

Color. Above sepia brown and dusky; posterior part of back darkest; beneath ash gray; tail above dusky, beneath whitish.

Measurements. Total length, 105–108.1; tail vertebræ, 45.5–46.9; hind foot, 12.7–13.4.

b.—arcticus. (*Sorex*), Merr., Proc. Wash. Acad. Scien., 1900, p. 17.

Type locality. St. Michael's, Alaska.

Genl. Char. Similar to *S. personatus*; tail longer, color paler.

Color. Summer Pelage. Above pale drab brown; beneath ashy white.

Winter Pelage. Above dusky brown and white; beneath silvery white washed with very pale buff.

Measurements. Total length, 108; tail vertebræ, 39; hind foot, 12.

538. richardsoni. (*Sorex*), Bach. Journ. Acad. Nat. Scien. Phil., vol. vii, 1837, p. 383, pl. xxlv, fig. 5.

parvus, Rich. (nec Say), Faun. Bor. Am., 1829, p. 8.

Type locality. Unknown.

Geogr. Distr. Northern Minnesota and Saskatchewan Plains.

Genl. Char. Size large; tail short. Skull similar to that of *S. fumeus*, but generally larger.

Color. Above seal brown; sides ochraceous; beneath plumbeous tinged with chestnut; tail above dusky, beneath brownish. Some specimens have ashy sides, and under parts ash gray.

Measurements. Total length, about 113; tail vertebræ, 40; hind foot, 14.

539. tundrensis. (*Sorex*), Merr., Proc. Wash. Acad. Scien., 1900, p. 16.

Type locality. St. Michael's, Alaska.

Genl. Char. Size large; pelage bicolor in winter, tricolor in summer.

Color. Summer Pelage. Top of head and back drab brown; sides paler buffy brown; under parts whitish. Tail above brown, tip dusky, beneath buffy.

Measurements. Total length, 108; tail vertebræ, 32; hind foot, 13.

540. sphagnicola. (*Sorex*), Coues, Bull. U. S. Geol. and Geog. Surv., vol. iii, 1887, p. 650.

belli, Dobson, Ms. Merr. Proc. Biol. Soc. Wash., 1892, p. 25.

Type locality. Vicinity of Fort Laird, British Columbia, lat. 60°.

Geogr. Distr. British Columbia and Hudson Bay.

Genl. Char. Size medium; tail shorter than body; large, com-

pletely haired; unicuspid large, gradually diminishing to fourth; first and second subequal.

Color. Above dark seal brown, darkest on rump; grayish brown along the belly; tail dark brown all around.

Measurements. Total length, 110; tail vertebræ, 42; hind foot, 13.5.

541. fumeus. (*Sorex*), Miller, N. Am. Faun., No. 10, 1895, pp. 50-52.

platyrhinus, Dobson (nec DeKay), Mon. Insect., 1890, Pt. 111, fasc. 1, pl. xxiii, fig. 5.

Type locality. Peterboro, N. Y.

Geogr. Distr. Eastern United States, Nova Scotia, New Brunswick east to Ontario and the Great Lakes.

Genl. Char. Size of *S. richardsoni*. Back without distinct dark median area. Color, smoky plumbeous gray.

Color. In autumn and winter. Back smoke gray, the hair everywhere tipped with seal brown, producing a finely grizzled appearance; the dark tips slightly more conspicuous over rump and lumbar region, less numerous on the sides and disappearing entirely on the belly, where the fur is pale broccoli brown. Everywhere the fur is slate color at base. Tail indistinctly bicolor seal brown dorsally, yellowish white ventrally; feet yellowish white.

In Summer. Dull hair brown throughout, paler on the belly, and very slightly darker on the back.

Measurements. Total length, 116; tail vertebræ, 44; hind foot, 12.6. (Miller, l. c.)

542. macrurus. (*Sorex*), Batchelder, Proc. Biol. Soc. Washington, 1896, x, p. 133.

Type locality. Beedes, Essex County, New York.

Genl. Char. Size large; tail long; body stout.

Color. Upper parts slate or blackish slate; under parts dark smoke or brownish mouse gray; tail above brown, beneath brownish flesh color; hind and fore feet above, fawn color.

Measurements. Total length, 130; tail vertebræ, 60; hind foot, 15; ear, 10.

543. setosus. (*Sorex*), Elliot, Pub. Field Col. Mus., 1899, 1, p. 274, Zoölogy.

Type locality. Happy Lake, Clallam County, Olympic Mountains, Washington.

Geogr. Distr. Only known from type locality.

Genl. Char. Larger than either *S. vagrans* or *S. obscurus*. Similar in the color of the back but with brighter sides, and grayish white

beneath with a tint of buff. Bristles on sides buff colored. Third unicuspid smaller than fourth. Tail about one-fifth shorter than body and head.

Color. Entire upper parts light cassell brown with a grayish sheen upon it, which causes it to vary in depth according to the light in which the specimen is held. Flanks, brownish ochre with a spot denuded of fur in the center, covered by a bunch of buff-colored bristles. Under parts grayish white, almost silvery in certain lights, tinted with buff. Legs and feet flesh color. Tail dark brown above, yellowish white beneath.

Measurements. Total length, 120; tail vertebræ, 54; hind foot, 13.

544. *vagrans*. (*Sorex*), Baird, Mamm. N. Am. 1857, p. 15, pl. xxvi, fig. 1675.

suckleyi, Baird, Mamm. N. Am., 1857, p. 18, pl. xxvii, fig. 1677.

Type locality. Shoalwater Bay, Washington.

Geogr. Distr. Southern British Columbia, western Washington and Oregon, and northern California to Monterey on coast, and to Fort Crook in the mountains.

Genl. Char. Size small; tail as long as body, scantily haired at tip; third unicuspid smaller than fourth. Skull like that of *S. obscurus*, but upper molars and large premolar are smaller.

Color. Above dark brown or russet; beneath ashy; tail above dusky, beneath paler.

Measurements. Total length, 190; tail vertebræ, 43.5; hind foot, 12.3.

a.—dobsoni. Merr. N. Am. Faun., No. 5, 1891, pp. 33-34, pl. lv, fig. 2.

Type locality. Saw Tooth or Alturas Lake, east base of Saw Tooth Mountains, Idaho.

Geogr. Distr. Rocky Mountains in northern Idaho and western Montana; also Big Snowy and Prior Mountains, Montana; Big Horn Mountains, Wyoming, and Wasatch Mountains, Utah.

Genl. Char. Size small; pelage short; third unicuspid much smaller than fourth. Similar to *S. vagrans* in size and general appearance, but color grayish brown instead of chestnut brown; teeth broader.

Color. Above dull sepia brown, not darker on the rump. Under parts drab gray slightly tinged with brown. Tail above sepia brown, beneath drab gray.

Measurements. Total length, 105; tail vertebræ, 47; pencil, 4.5; hind foot, 12.5.

b.—monticola. (*Sorex*), Merr., N. Am. Faun., No. 3, 1890, pp. 43-44.

Type locality. San Francisco Mountains, Arizona (11,500 feet).

Geogr. Distr. Arizona.

Genl. Char. Size small, similar to *S. vagrans*, third unicuspid much smaller than fourth; teeth broad.

Color. Upper parts sepia brown, paler on the sides; under parts much lighter. Tail above sepia brown, beneath paler.

Measurements. Total length, 107; tail vertebræ, 45; hairs, 2; hind foot, 12.5; ear from crown, 3.

545. amoenus. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 69.

Type locality. Mammoth Pass, Owens River, east slope Sierra Nevada, California.

Geogr. Distr. Northern California.

Genl. Char. Similar to *S. vagrans*, but larger; tail shorter.

Color. Upper parts dark, fuliginous mixed with brownish; sides pale brownish; under parts buffy whitish. Tail blackish above, whitish below.

Measurements. Average of two specimens from type locality. Total length, 103; tail vertebræ, 37; hind foot, 12.3.

546. vancouverensis. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 70.

Type locality. Goldstream, Vancouver Island, British Columbia.

Geogr. Distr. Vancouver Island.

Genl. Char. Similar to *S. vagrans*, but larger.

Color. Above mixed dusky and sepia brown, the former prevailing on the back, the latter on the sides, where it forms an indistinct band; under parts plumbeous, tipped with ash and washed with rusty. Tail above dark brown, paler below on basal half.

Measurements. Total length, 110; tail vertebræ, 43; hind foot, 12.

547. nevadensis. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 71.

Type locality. Reese River, Nevada.

Geogr. Distr. Nevada, Great Basin.

Genl. Char. Size small. Similar to *S. vagrans*, but tail shorter and color different.

Color. Above mixed slate black and hoary; sides indistinctly buffy, under parts hoary. Ears brownish. Tail dusky above and whitish below, tip dark.

Measurements. Average of four specimens from type locality. Total length, 96.5; tail vertebræ, 39; hind foot, 12.5.

548. obscurus. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, pp. 72-73, pl. viii, figs. 1, 1a.

vagrans similis, Merr., N. Am. Faun., No. 5, 1891, pp. 34-35, pl. iv, fig. 3. (nec Hensel.)

Type locality. Timber Creek, Salmon River Mountains, Idaho (8,200 feet).

Geogr. Distr. British Columbia, and Mountains of western Washington, Idaho, Montana, Wyoming, Utah and Colorado; south in California to Mt. Whitney.

Genl. Char. Similar to *S. vagrans*, but slightly larger with the skull and mandible conspicuously larger and heavier.

Color. Above sepia brown tinged with pale rufous. Under parts drab gray tinged with buff. Tail above sepia brown, below drab gray.

Measurements. Total length, 102-119; tail vertebræ, 39-53.9; hind foot, 12.5-13.8.

a.—longicaudus. (*Sorex*), Merr. N. Am. Faun., No. 10, 1895, p. 74.

Type locality. Wrangel, Alaska.

Geogr. Distr. "Coast of southeast Alaska from Wrangel southward; also coast of Washington, including Puget Sound and Skagit Valley."

Genl. Char. Similar to *S. bairdi* in color, length of tail and external appearance; similar to *S. obscurus* in cranial and dental characters.

Color. Above dark chestnut brown; beneath buffy ash, suffused with pale chestnut brown on the belly. Tail dark brown above, buffy below.

Measurements. Average of 27 specimens from Wrangel, Alaska. Total length, 128.8; tail vertebræ, 58.1; hind foot, 15.5. (Merriam, l. c.)

549. *glacialis.* (*Sorex*), Merr., Proc. Wash. Acad. Scien., 1900, p. 16.

Type locality. Point Gustavus, Glacier Bay, Alaska.

Genl. Char. Similar to *S. o. longicaudus*, but smaller and darker.

Color. Above dusky brown; beneath whitish. Tail above and tip brownish dusky, below buffy.

Measurements. Total length, 122; tail vertebræ, 52; hind foot, 14.

b.—alascensis. Merr., N. Am. Faun., No. 10, 1895, p. 76.

Type locality. Yakutat Bay, Alaska.

Geogr. Distr. Juneau to Yakutat Bay, Alaska.

Genl. Char. Size large; tail medium, about equal to body without head; hind foot nearly 15.

Color. Above sepia brown mixed with light tipped hairs; beneath ash gray, the plumbeous showing through. Tail above dark brown, below whitish.

Measurements. Total length, 115; tail vertebræ, 45; hind foot, 14.5.

a.—shumaginensis. (*Sorex*), Merr., Proc. Wash. Acad. Scien., 1900, p. 18.

Type locality. Popof Island, Shumagin Group, Alaska.

Genl. Char. Similar to *S. g. alascensis*, but smaller and paler.

Color. Above brown and whitish, "pepper and salt" appearance; beneath grayish white; indistinct pale fulvous band on flanks.

Measurements. Total length, 112; tail vertebræ, 42; hind foot, 14.

550. bairdi. (*Sorex*), Merr., N. Am. Faun., 1895, p. 77, pl. vii, figs. 3, 3a.

Type locality. Astoria, Oregon.

Geogr. Distr. Coast of Oregon.

Genl. Char. Similar to *S. o. longicaudus*, but skull larger and anterior unicuspid much more swollen.

Color. Above dark chestnut brown mixed with black on back, beneath chestnut brown; tail dark brown above, pale buffy brownish below.

Measurements. Average total length, 129; tail vertebræ, 57; hind foot, 15.1.

551. trowbridgei. (*Sorex*), Baird, Mamm., N. Am., 1857, pp. 13-15.

Type locality. Astoria, Oregon.

Geogr. Distr. Western Washington and Oregon, west of Cascade Range.

Genl. Char. Similar to *S. montereyensis*, but third lateral incisor smaller than the fourth, anterior upper incisor with a moderate internal lobe.

Color. Above sooty brown or black, slightly variegated with hoary, beneath paler; tail blackish above, whitish beneath.

Measurements. Average total length, 121; tail vertebræ, 57.7; hind foot, 13.7.

552. montereyensis. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 79.

Type locality. Monterey, California.

Geogr. Distr. Coast and Sierra Nevada of California; south on coast to Morro and San Luis Obispo; south in the Sierra to Sequoia National Park and East Fork Kaweah River.

Genl. Char. Size large; tail long; skull and teeth similar to *S. trowbridgei*, but heavier.

Color. Above slate black, grading into dull plumbeous brown on the belly. In summer the back is brownish. Tail blackish above, whitish beneath.

Measurements. Average total length, 120; tail vertebræ, 52.4; hind foot, 14.8.

553. ornatus. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 79, pl. viii, figs. 3, 3a.

Type locality. San Emigdio Cañon, Mount Pinos, California.

Geogr. Distr. Southern California from head of Ventura River and Mount Pinos easterly to San Bernardino Peak, and south through the San Jacinto range to Santa Isabel.

Genl. Char. Similar to *S. californicus*, but larger, with much longer tail, larger ears and feet, and dark rump patch.

Color. Above ash gray, darker on the rump, forming a patch on posterior half of back; sides and beneath whitish; tail dark above, pale below.

Measurements. Total length, 108; tail vertebræ, 43; hind foot, 13.

554. californicus. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 80, pl. xii, figs. 6, 7.

Type locality. Walnut Creek, Contra Costa County, California.

Geogr. Distr. California.

Genl. Char. Size small; tail shorter than body without head; skull small and flat; third unicuspid barely half the size of the fourth.

Color. Above dark ash gray and blackish, sometimes washed with brownish; beneath plumbeous, tipped with whitish.

Measurements. Average total length, 93; tail vertebræ, 34.5; hind foot, 11.5.

555. shastensis. (*Sorex*), Merr., N. Am. Faun., No. 16, 1899, p. 87.

Type locality. Mount Shasta, California.

Geogr. Distr. Known only from type locality.

Genl. Char. "Small, tail short, ears small; third unicuspid smaller than fourth. Skull: rostrum small, constriction swollen; unicuspids narrower than in *S. californicus*; large premolar, very broad posteriorly."

Color. "Head and sides of neck to shoulders dull rufous brown; rest of upper parts dark steel gray; under parts ashy brown; tail sharply bicolor, dusky above, buffy below, becoming dusky toward tip."

Measurements. "Total lengths, 90; tail vertebræ, 35; hind foot, 12." (Merr., l. c.)

556. tenellus. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 81, pl. xii, figs. 8, 9.

Type locality. Alabama Hills, near Lone Pine, Owens Valley, California.

Geogr. Distr. Southeastern California.

Genl. Char. Similar to *S. californicus*, but the skull is flatter, smaller and much narrower.

Color. Above pale ash gray, beneath white; feet white; tail dark above, white beneath.

Measurements. Total length, 103; tail vertebræ, 42; hind foot, 12.5.

a.—nanus. Merr., N. Am. Faun., No. 10, 1895, p. 81, pl. viii, figs. 5, 5a.

Type locality. Estes Park, Colorado.

Geogr. Distr. Colorado, Montana (Fort Custer).

Genl. Char. Size small, similar to *S. tenellus*, skull more slender and teeth smaller.

Color. Above sepia brown, darkest on the back, under parts and feet grayish ash; tail above sepia brown, beneath whitish, tip dark.

Measurements. Total length, 105; tail vertebræ, 42; hind foot, 10.

557. longirostris. (*Sorex*), Bachm. Jour. Acad. Nat. Scien. Phil., 1837, III, Pt. 11, pp. 370–373, pl. xxiii, fig. 2.

Type locality. Swamps of Santee River, South Carolina.

Geogr. Distr. North and South Carolina, probably Georgia and Florida also.

Genl. Char. Size small; third unicuspid smaller than fourth.

Color. Above chestnut brown, beneath ashy tinged with drab; tail above dark brown, beneath paler.

Measurements. Average total length, 85.6; tail vertebræ, 31.9; hind foot, 10.7.

558. fisheri. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 86, pl. lv, fig. 4.

Type locality. Lake Drummond, Dismal Swamp, Virginia.

Geogr. Distr. Virginia and North Carolina.

Genl. Char. Similar to *S. longirostris*, but larger.

Color. Above dull chestnut brown, beneath drab brown; tail above very dark brown, beneath pale brownish, tip dark all around.

Measurements. Total length, 108; tail vertebræ, 39; hind foot, 12.

559. pacificus. (*Sorex*), Baird, Bull. U. S. Geol. and Geog. Surv., 1877, III, 3, p. 650.

Type locality. Fort Umpqua, mouth of Umpqua River, Oregon.

Geogr. Distr. Pacific coast from Point Reyes, California, to Yaquina Bay, Oregon.

Genl. Char. Size large, skull massive; first and second unicuspid subequal; fourth larger than third; fifth, variable, orange tipped.

Color. Cinnamon rufous in summer; in winter the pelage is darker.

Measurements. Total length, average, 150; tail vertebræ, 63; hind foot, 17.

560. pribilofensis. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 87, pl. ix, figs. 3, 3a.

Type locality. St. Paul Island, Pribilof Islands.

Genl. Char. Size rather small; tail short, thick and remarkably hairy; unicuspid diminishing from before backwards, as in *S. personatus*; third larger than fourth.

Color. Head and band down the back chocolate brown, sides dull, ochraceous buff; under parts dirty white; chin, throat and feet, white; tail brown above, white beneath.

Measurements. Total length, 107; tail vertebræ, 35; hind foot, 13.5.

561. merriami. (*Sorex*), Dobson, Mon. Insectivora, Part III, fasc. 1, 1890, pl. xxiii, fig. 6.

Type locality. Fort Custer, Montana.

Geogr. Distr. Only known from type locality.

Genl. Char. Size medium; tail not quite so long as body, ears very large. Skull: brain case flat; rostrum and palate short, broad; second unicuspid the largest; fourth smaller than third; middle incisor without secondary cusp on inner side.

Color. Above ash gray tinged with buffy; sides and beneath, white; feet white; tail above buffy white, beneath white.

Measurements. Total length, 90; tail vertebræ, 36; hind foot, 11.

a.—miscix. (*Sorex*), Bangs, Proc. N. Eng. Zool. Soc., 1, 1899, p. 15.

Type locality. Black Bay, Labrador.

Geogr. Distr. Labrador.

Genl. Char. Large as *S. p. streatori* Merr. from Alaska; hind foot larger than in *S. personatus*; colors paler and grayer at all seasons, but especially so in winter. Skull much larger, brain case much higher, foramen magnum smaller and narrower.

Color. Summer Pelage. Upper part broccoli brown, shading on rump towards sepia, the amount of sepia varying much in different individuals, in some skins spreading well up over the back; under parts pale smoky gray; tail, feet and hands as in *S. personatus*.

Winter Pelage. Upper parts, drab gray; under parts, base of hairs slate gray; tips silvery gray, the basal slate gray showing in places; tail more hairy than in summer and more sharply bicolored.

Measurements. Total length, 104; tail vertebræ, 44; hind foot, 14 (Bangs l. c.)

93. *Microsorex*.

I. $\frac{4-4}{2-2}$; C. $\frac{1-1}{0-0}$; P. $\frac{2-2}{1-1}$; M. $\frac{3-3}{3-3}$ = 32.

Microsorex. Baird, in Coues Prec. Notes on Am. Insect. Mamm., Bull. U. S. Geol. and Geog. Survey, 1877, 111, No. 3, p. 646.
Type *Sorex hoyi*, Baird.

Inner side of canines, and second and third upper incisors with a distinct secondary cusp; fourth upper incisor very minute and nearly hidden between third incisor and canine; brain case low and narrow; mandible short and heavy; feet never fringed.

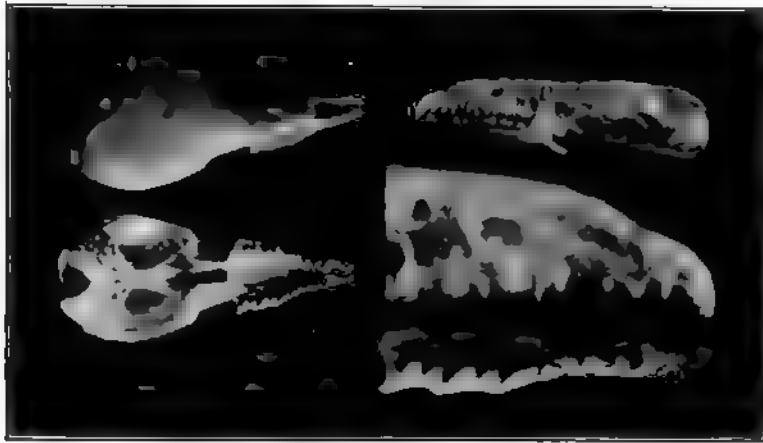


FIG. 71. *MICROSOREX HOYI*.

No. 8005 Am. Mus. Nat. Hist. Coll.

Skull $2\frac{1}{2}$ times nat. size.

Tooth rows 6 times nat. size.

562. *hoyi*. (*Sorex*), Baird, Mamm. N. Am., 1857, pp. 32-33, pl. xxviii.

thompsoni, Baird, Mamm. N. Am., 1857, p. 34.

Type locality. Racine, Wisconsin.

Geogr. Distr. Labrador to British Columbia, northern Minnesota and North Dakota.

Genl. Char. Very small and slender. Ears prominent, feet very small. Tail about as long as the body exclusive of head. Remaining characters like those of subgenus.

Color. Above chestnut brown, with a little hoariness; sides hair brown; beneath dull rusty white. Tail pale isabella color, as are also the feet.

Measurements. Average total length, 83; tail vertebrae, 32; hind foot, 10.7.

94. *Neosorex*.

I. $\frac{4-4}{2-2}$; C. $\frac{1-1}{0-0}$; P. $\frac{2-2}{1-1}$; M. $\frac{3-3}{3-3}$ = 32.

Neosorex. Baird, Mamm. N. Am., 1857, p. 11. *Type Neosorex navigator*, Baird.

Inner side of canines and incisors without secondary cusps; fourth upper incisor well developed, brain case broad; mandible slender and lightly built; feet fringed with bristle-like hairs.



FIG. 72. *NEOSOREX PALUSTRIS*.

No. 2532 Am. Mus. Nat. Hist. Coll.

Skull twice nat. size.

Tooth rows enlarged 5 times.

563. *palustris*. (*Sorex*), Richardson, Zool. Journ., vol. iii, 1828, p. 571.

Type locality. Marshy places between Hudson Bay to Rocky Mountains.

Geogr. Distr. Central Minnesota to east base of Rocky Mountains.

Genl. Char. Same as those of the subgenus.

Color. Above seal brown and hoary; fur at base slate gray; belly pale smoke gray, sometimes tinged with cream color; feet sepia; tail above and at tip seal brown, beneath pale smoke gray.

Measurements. Total length, 157; tail vertebræ, 68; hind foot, 20.

a.—navigator. (*Neosorex*), Baird, Mamm. N. Am., 1857, pp. 11-12, pl. xxvi.

palustris, Merr. N. Am. Faun., 1891, No. 5, p. 35 (nec Richard).

Type locality. Stated to be Fort Vancouver, Washington, but probably the type came from northern Idaho.

Geogr. Distr. Rocky Mountains from British Columbia to southern Colorado; Sierra Nevada of California south to Sequoia National Park.

Genl. Char. Similar to *N. palustris*, but smaller. Feet large and broad; tail longer than head and body, with a distinct pencil at tip; third lateral tooth smaller than the fourth.

Color. Above sooty brown mixed with hoary; beneath grayish white; tail silver white beneath, dusky above.

Measurements. Average of 8 specimens from Preyor Mountains, Montana. Total length, 148.4; tail vertebræ, 71.5; hind foot, 20.4; (Merriam).

b.—alaskanus. Merr. Proc. Wash. Acad. Scien., 1900, p. 18.

Type locality. Point Gustavus, Glacier Bay, Alaska.

Genl. Char. Similar to *N. p. navigator*, but smaller.

Color. Above slate gray; under parts and feet whitish; tail above and tip dusky; beneath whitish.

Measurements. Total length, 145; tail vertebræ, 65; hind foot, 18.5.

564. albibarbis. (*Neosorex*), Cope, Proc. Acad. Nat. Scien. Phil., 1862, pp. 188-189.

Type locality. Profile Lake, Franconia Mountains, New Hampshire.

Geogr. Distr. Pennsylvania northward to Labrador.

Genl. Char. Similar to *N. palustris*, but dusky beneath. Skull and teeth smaller, the anterior unicuspid narrower, and molars less deeply excavated behind.

Color. Above blackish slate mixed with light tipped hairs; beneath dusky; tail blackish above, whitish below on basal two-thirds.

Measurements. Total length, 153; tail vertebræ, 66.6; hind foot, 19.

565. hydrodomus. (*Sorex*), Dobson, Ann. and Mag. Nat. Hist., 6th ser., vol. 4, 1889, pp. 372-374.

Type locality. Unalaska Island, Aleutian Islands, Alaska.

Gen. Char. Third incisor larger than fourth; fore and hind feet fringed on both sides, especially dense on outer margins.

Color. "Fur reddish brown above, yellowish brown beneath;

chin, throat and chest with grayish tipped hairs; the base of the hairs both above and beneath dark bluish gray."

Measurements. "Length head and body, 53; tail, 46; eye from end of muzzle, $9\frac{1}{2}$; ear length, $6\frac{1}{2}$; elbow to end of middle digit without claw, 13; hand, 6; foot, 13; distance between tips of first upper incisor and last premolar, $3\frac{1}{2}$."

95. *Atophrax*.

I. $\frac{1-1}{2-2}$; C. $\frac{1-1}{0-0}$; P. $\frac{2-2}{1-1}$; M. $\frac{3-3}{3-3}$ = 32.

Atophrax. Merr., Trans. Linn. Soc. N. Y., 1884, p. 217.

"Feet large and fimbriate, with third and fourth toes of hind foot webbed at base as in *Neosorex*. Anterior part of rostrum narrowed, much produced and recurved, forming, with the under jaw, a toothed forceps for seizing living prey. Brain case expanded laterally as in *Neosorex*. Unicuspidate teeth parallel, the fifth with a colored cusp, sometimes bifid. Two first upper molars with two internal cusps, the secondary one diagnostic of the subgenus is separated by a sulcus from the large triangular cusp developed on the cingulum of the posterior half of the inner side of the tooth."

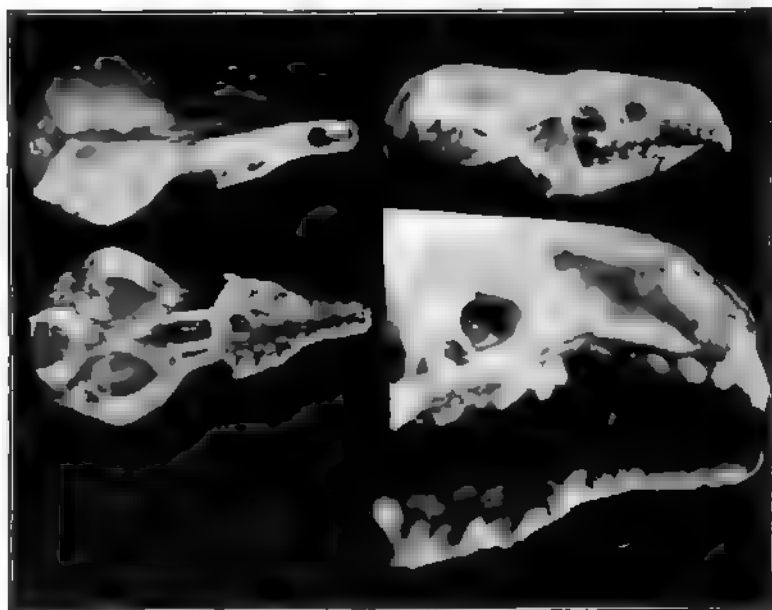


FIG. 73. *ATOPHRAX BENDIRII*.

No. 2379 Am. Mus. Nat. Hist. Coll.

Skull twice nat. size.

Tooth rows enlarged 5 times

566. bendirii. (*Atophyrax*), Merr., Trans. Linn. Soc. New York, vol. ii, 1884, pp. 217-225.

Type locality. Klamath Basin, Oregon.

Geogr. Distr. Klamath Basin, Oregon, northward along east side of Cascade Range to Puget Sound, westward to coast of California and south to Sonoma County.

Genl. Char. Size large; tail long; other characters those of the subgenus.

Color. Sooty plumbeous, paler on under parts; tail dusky.

Measurements. Total length, 150; tail vertebræ, 68; hind foot, 20.

a.—palmeri. (*Sorex*), Merr., N. Am. Faun., No. 10, 1895, p. 97, pl. xii, figs. 1-3.

Type locality. Astoria, Oregon.

Geogr. Distr. Coast of Oregon, Willamete Valley.

Genl. Char. Similar to *S. bendirii*, but larger, blacker, skull heavier.

Color. Above shining black, grading into sooty plumbeous beneath; tail dusky.

Measurements. Total length, 165; tail vertebræ, 73; hind foot, 20.

b.—albiventer. (*Sorex*), Merr. N. Am. Faun., No. 10, 1895, p. 97.

Type locality. Lake Cushman, Olympic Mountains, Washington.

Geogr. Distr. Olympic Mountains, Washington.

Genl. Char. Similar to *S. bendirii*, but larger, beneath whitish; tail longer; skull and teeth larger.

Color. Above sooty plumbeous; beneath white, tinged with dusky on breast and middle of belly. Tail blackish above, beneath paler at base.

Measurements. Total length, 166; tail vertebræ, 78; hind foot, 20.5.

96. Blarina.

I. $\frac{4-4}{2-2}$, or $\frac{3-3}{2-2}$; C. $\frac{1-1}{0-0}$; P. $\frac{2-2}{1-1}$; M. $\frac{3-3}{3-3} = 32$ or 30.

Blarina. Gray, Proc. Zool. Soc., 1837, p. 124. Type *Sorex talpoides*.

Gapper = *S. brevicaudus*, Say.

Corsira. Gray, Proc. Zool. Soc., 1837, p. 123.

Brachysorex. Duvern. Mag. Zool., 2nd Ser., 1842, p. 37.

Blaria. Gray, List Spec. Mamm. Brit. Mus., 1843, xxi.

Talposorex. Pomel (nec Lesson), Archiv. Scien. Phys. and Nat., Genève, 1848, ix, p. 248.

Galemys. Pomel (nec Kaup), Archiv. Scien. Phys. and Nat., Genève, 1848, ix, p. 249. (Part.)

Cryptotis. Pomel, Archiv. Scien. Phys. and Nat., Genève, 1848, p. 249.

Anotus. Wagn. Supp. Schreb. Säugth., 1855, p. 550.

Sorieiscus. Coues, Bull. U. S. Geol. and Geog. Surv., 1877, p. 649.

Ear conch truncated above; tail short; fourth upper incisor rudimentary or absent; first and second unicuspid largest, subequal; middle incisor with elongate basal lobe; brain case highest at lambdoidal suture.



FIG. 74. BLARINA BREVICAUDA

No. 3583 Am. Mus. Nat. Hist. Coll.

Skull twice nat. size.

Tooth rows 4 times nat. size.

567. brevicauda. (*Sorex*), Say in Long's Exped. Rocky Mts., vol. 1, 1823, p. 164.

talpoides, Gapper, Zool. Jour., 1830, v, p. 202, pl. viii.

dekayi, Bach. Jour. Acad. Nat. Scien. Phil., 1837, vii, p. 377.

micrura, Pomel, Archiv. Scien. Phys. et Nat. Genève, 1848, p. 249.

angusticeps, Baird, Mamm. N. Am., 1857, p. 47.

costaricensis, Allen, Bull. Am. Mus. Nat. Hist. N. Y., 1891, p. 205 (not from Costa Rica).

Type locality. Near Blair, three miles above mouth of Boyer River, Nebraska.

Geogr. Distr. Atlantic coast to Nebraska, and Manitoba.

Genl. Char. Skull largest and heaviest of the American Soricidae.

Color. Above sooty plumbeous, beneath ashy plumbeous.

Measurements. Total length, average, 127; tail vertebræ, 26.5; hind foot, 16.5.

a.—carolinensis. (*Sorex*), Bachm., Jour. Acad. Sci. Phil., vii, Part 11, 1837, pp. 366–370.

Type locality. Eastern South Carolina.

Geogr. Distr. Chesapeake Bay to Arkansas.

Genl. Char. Intermediate between *B. brevicauda* and *B. parva*; hind foot small as in *B. parva*. Occipital plane of skull more arched than in *B. brevicauda*, mandible weaker.

Color. Above sooty plumbeous; paler beneath.

Measurements. Total length, 99.5; tail vertebræ, 20.5; hind foot, 12.5.

b.—hulophaga. (*Blarina*), Elliot, Pub. Field Columb. Mus., 1899, 1, p. 287, Zoölogy.

Type locality. Dougherty, Indian Territory.

Geogr. Distr. Known only from type locality.

Genl. Char. Similar to *B. b. carolinensis*, but lighter in color and differing in the character of the teeth, and with an extremely short tail. Skull: occipital plane flat as in *B. brevicauda*, only slightly elevated above the frontals; mandible equally massive for the relative size, and the angle well pronounced. Pterygoid fossa as long as that of *B. brevicauda*, notwithstanding the shorter length of skull. Incisors broad at base and sloping forwards, fifth unicuspid not visible from the outside, first and second unicuspids more than twice the size of the following three, and projecting forward. Middle cusp of first upper molar large and pyramidal in shape.

Color. Adult Male. Uniform silvery gray in most lights, changing to light brown in others; under parts pale hues of same colors and when viewed against the hair becoming buff. Feet flesh color. Tail brown above, brownish white below.

Measurements. Total length, 100; tail vertebræ, 18; hind foot, 12. Skull: occipito-nasal length, 20; length of Hensel, 17; greatest mastoid breadth, 9; palatal length, 8; pterygoid, 3.

c.—peninsulae. (*Blarina*), Merr., N. Am. Faun., No. 10, 1895, p. 14.

Type locality. Miami River, Dade County, Florida.

Geogr. Distr. Peninsula of Florida, south of latitude 28°.

Genl. Char. Similar to *B. b. carolinensis*, but with larger hind feet and more slaty coloration; molariform teeth larger.

Color. Upper parts uniform slate black, darker below; lacks the sepia brown tint of *B. b. carolinensis*.

Measurements. Total length, 97; tail vertebræ, 20; hind foot, 13.5.

568. telmalestes. (*Blarina*), Merr., N. Am. Faun., No. 10, 1895, p. 15, pl. ii, fig. 5.

Type locality. Lake Drummond, Dismal Swamp, Virginia.

Geogr. Distr. Dismal Swamp, Virginia.

Genl. Char. Similar to *B. brevicauda*, skull narrower; anterior nares less thickened.

Color. Uniform dark plumbeous or slate gray above and below, slightly darker on the rump and nose; feet and tail blackish.

Measurements. Total length, 118; tail vertebræ, 28; hind foot, 16.

I. *Cryptotis*.



FIG. 75. BLARINA (CRYPTOTIS) PARVA.

No. 938 Am. Mus. Nat. Hist. Coll.

Skull enlarged $2\frac{1}{2}$ times.

Tooth rows enlarged 7 times.

569. parva. (*Sorex*), Say, in Long's Exped. to Rocky Mts., 1823, vol. 1, p. 164.

cinereus, Bachm., Jour. Acad. Nat. Scien. Phil., 1837, vii, p. 373, pl. xxiii, fig. 3.

exilipes, Baird, N. Am. Mamm., 1857, p. 51.

eximius, Baird, N. Am. Mamm., 1857, p. 52.

Type locality. Near Blair, Nebraska, west bank of Missouri River.

Geogr. Distr. Atlantic coast to eastern Nebraska and Texas.

Genl. Char. Smallest of United States species; last upper unicuspid usually not visible from outside; upper molars deeply excavated posteriorly.

Color. Above sepia to dark hair brown; beneath ash gray. Tail above sepia, below ash gray.

Measurements. Total length, average, 79; tail, vertebræ, 16; hind foot, 10.6.

570. floridana. (*Blarina*), Merr., N. Am. Faun., No. 10, 1895, p. 19, pl. i, fig. 7.

Type locality. Chester Shoal, 11 miles north of Cape Canaveral, Brevard County, Florida.

Geogr. Distr. Peninsular Florida, south of latitude 29°.

Genl. Char. "Similar to *B. parva*, but larger, with longer skull, whiter teeth, and larger molars, which are less deeply emarginate posteriorly."

Color. Winter Pelage. Above iron gray, beneath paler.

Summer Pelage. Inclined to sepia.

Measurements. Average from two specimens from type locality. Total length, 89; tail vertebræ, 22; hind foot, 12. (Merriam, l. c.)

96. Notiosorex.

$$I. \frac{3-3}{2-2}; C. \frac{1-1}{0-0}; P. \frac{1-1}{1-1}; M. \frac{3-3}{3-3} = 28.$$

Notiosorex. Baird, in Coues Bull. U. S. Geol. and Geog. Surv., 1877, p. 646. Type *Sorex crawfordi*, Baird.

Third unicuspid half the size of second; all narrow at base, inner side without secondary cusplet; anterior teeth orange at tips; molars white, cranium flat, rounded on sides; tail short, not half as long as head and body.

571. crawfordi. (*Sorex*), Baird, Bull. U. S. Geol. and Geog. Surv., 1877, iii, p. 657.

Type locality. Fort Bliss, New Mexico.

Geogr. Distr. Eastern Texas to southern California.

Genl. Char. Size small; ears large, conspicuous; hind feet and tail short; other characters same as those of the genus.

Color. Above olive gray; beneath whitish; tail bicolor agreeing above and below with the hues of the body.

upper molar bilobed; bullæ incomplete; snout and tail elongate; nostrils lateral in terminal naked pad of snout; fore feet broad; claws long, acute, compressed.

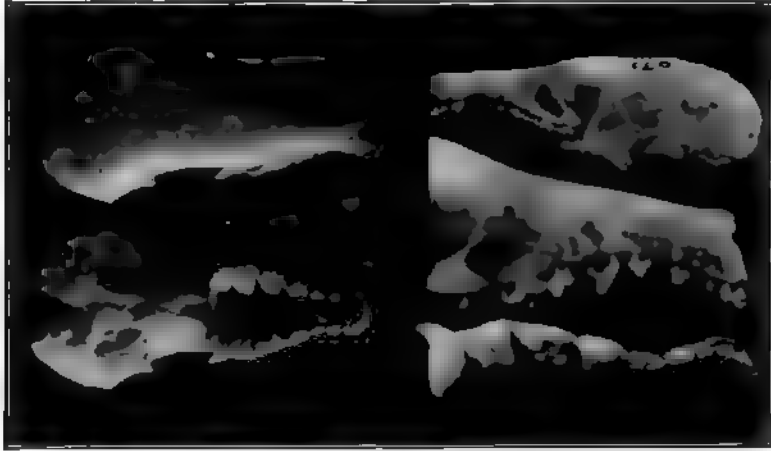


FIG. 77. NEÜOTRICHUS GIBBSII.

No. 872 Field Columbian Museum Coll.

Skull twice nat. size.

Tooth rows enlarged 4 times.

572. gibbsii. (*Urotrichus*), Baird, N. Am. Mamm., 1857, p. 76.

Type locality. White River Pass, Cascade Mountains, Washington.

Geogr. Distr. Fraser River, British Columbia, west of Cascade and Sierra Nevada Mountains to Shasta County, and thence along the coast of San Francisco Bay, California.

Genl. Char. Muzzle prolonged into a cylindrical tube, continued some distance beyond the incisors, terminating in a simple naked bulb. Nostrils cylindrical, opening in the side; eyes and ears concealed. Tail long and hairy; fore foot moderately large, shorter than the hind feet. Upper and under surface of both covered with small plates.

Color. "Dark sooty brown almost inappreciably lighter beneath, the color almost uniform from the roots; a little more bluish perhaps in the covered portions. Some of the hairs are more lustrous than others, and reflect light so as to impart a hoary appearance. The fur is long and not very compact, longest hair twentieth of an inch." (Baird, l. c.)

a.—major. (*Neüotrichus*), Merr., N. Am. Faun., No. 16, 1899, p. 88.

Type locality. Carberry Ranch, Shasta County, California.

Geogr. Distr. Canadian zone, Shasta County, California.

Genl. Char. "Similar to *N. gibbsi*, but larger; tail longer, feet larger; under parts darker; upper large premolar smaller, with anterior cusp to the cingulum; lower large premolar larger than in *N. gibbsi*.

Color. Similar to *N. gibbsi*.

Measurements. Average total length, 120; tail vertebræ, 40; hind foot, 17.

b.—hyacinthinus. (*Neürotrichus*), Bangs, Am. Natur., 1897, **xxxi**, p. 240.

Type locality. Nicasio, Marin County, California.

Genl. Char. Larger than *N. gibbsi*; skull broader relatively.

Color. Black with green and purple reflections.

Measurements. Total length, average, 123.8; tail vertebræ, 39.7; hind foot, 17.

Sub. Fam. II. **Talpinae.**

Clavicle and humerus very short and broad; manus with a large falciforme bone.

98. **Scalops.**

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 40.$$

$$\text{Functional dentition. } I. \frac{3-3}{2-2}; C. \frac{1-1}{0-0}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 36.$$

Scalops. Cuv. Leç. Anat. Comp., 1800-1, (Desc. null.) Type none.

Talposorex. Less. (nec Schinz), Man. Mamm., 1827, p. 124.

Palate extending behind last molars; bullæ complete; first upper incisor large, next two minute; molars with narrow, anterior internal basal ledge; nostrils superior; sacral vertebræ and ischium connected by two bony bridges. Fore and hind toes webbed. Hand with an *os falciforme*.

573. aquaticus. (*Sorex*), Linn. Syst. Nat., 1758, p. 53.

europaea flavescens, Erxl. Syst. Regn. Anim., 1777, p. 118.

europaea flava, Gmel. Syst. Nat., 1788, p. 110.

flava, Kerr, Anim. King., 1792, p. 201.

fusca, Kerr, Anim. King., 1792, p. 202.

cupreata, Rafin. Prec. decouv. trav. somiol. Palerme, 1814, p. 14.

canadensis, Desm. Mamm., 1820, p. 155.

pennsylvanica, Harl. Faun. Amer., 1825, p. 33.

virginiana, De Blainv. Osteog. Atl., 1839-64, 1, p. 4, pls. v, ix.

pennantii, Le Conte, Proc. Acad. Nat. Scien. Phil., 1853, p. 327.

Type locality. Eastern United States.

Geogr. Distr. Massachusetts to Florida, westward to Mississippi.

Genl. Char. Eyes and ears minute, not covered by membrane.



FIG. 78. SCALOPS AQUATICUS.
No. 8525 Field Columbian Museum Coll.

Skull enlarged $\frac{1}{2}$ nat. size.

Tooth rows enlarged 4 times.

Fore feet very large, broader than long (exclusive of claws); toes webbed; palms naked. Tail short, slender, scantily covered with hair. Fur fine, velvety. Coronoid process of mandible heavy, with a tubercle on posterior margin.

Color. Uniform lead color tinged with brown, in some lights appearing dark, in others silvery gray. Feet and tail white.

Measurements. Total length, 100-150; tail, 20-28; hind foot, 20.

a.—marchinus. (*Talpa*), Rafn., Atlantic Journ., 1832, p. 61.

sericca, Rafn., Atl. Journ., 1832, p. 61.

argentatus, Aud. & Bach., Journ. Acad. Nat. Scien. Phil., 1842, p. 292.

Type locality. Near Lexington, Kentucky.

Geogr. Distr. Wisconsin and Minnesota, to Tennessee and Missouri; west to eastern Kansas, Nebraska and southwestern South Dakota.

Genl. Char. Largest of the genus. Nose elongate, depressed, naked and tuberculate; tail, one-sixth of whole length, white, squared, naked; feet white. Coronoid process of mandible large, triangular, posterior margin straight.

Color. Brown with grayish shades.

Measurements. Total length, 154.9; tail vertebræ, 33.8.

b.—intermedius. (*Scalops*), Elliot, Pub. Field Columb. Mus., 1899, 1, p. 280, Zoölogy.

Type locality. Alva, Oklahoma Territory.

Geogr. Distr. Oklahoma and Indian Territories.

Genl. Char. Similar in color to *S. a. texensis*, Allen, but much larger, being nearly of the same size as average specimens of *S. a. machrinus*.

Color. Entire under parts silvery brown, somewhat lighter than *S. a. texensis*, but in some lights this is replaced by a beautiful light purple sheen. Cheeks, chin and upper part of throat brownish green occasionally suffused with rust or orange color. Forehead with a small spot outside of nose pale pink, in some specimens orange. Breast, near the feet on front legs, and center of abdomen pale chestnut, rest of under parts plumbeous, with a silvery sheen in most lights. Feet and tail flesh color.

Measurements. Total length, 167; tail, 33; hind foot, 22; width of fore foot, 18.

c.—parvus. (*Scalops*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1894, p. 157.

australis, Chapman, Bull. Am. Mus. Nat. Hist., vol. v, 1893, p. 339.

Type locality. Gainesville, Florida.

Geogr. Distr. East Florida south to Lake Worth.

Genl. Char. Size small, hind foot long, coronoid process without a secondary process on the posterior margin.

Color. Uniform silvery grayish brown; upper surface of fore and hind feet very scantily covered with short whitish hairs; tail with a few long grayish hairs. Rusty spots often observable on nose and wrists.

Measurements. Total length, 148; hind foot, 17; tail, 22.

d.—texensis. (*Scalops*), J. A. Allen, Bull. Am. Mus. Nat. Hist., 1891, iii, p. 221.

Type locality. Presidio County (Aransas County?), Texas.

Geogr. Distr. Coast of Texas.

Genl. Char. Size very small, skull massive; frontal sinuses enlarged; mandible with broad coronoid process and straight posterior margin.

Color. Above pale chestnut brown with a greenish tinge; below darker, with rufous patches on breast, belly and towards end of nose.

Measurements. Head and body, 145; tail, 24; hind foot, 17; fore foot, length, 18; breadth, 14.5.

574. aereus. (*Scalops*), Bangs, Proc. Biol. Soc. Washington, 1896, x, p. 138.

Type locality. Stillwell, Indian Territory.

Genl. Char. Size larger than typical *S. a. texensis*; hind foot larger.

Color. "Rich coppery chestnut all over, without golden or orange suffusions; slightly duller below than above, and grayer on chin and throat."

Measurements. Total length, 154; tail vertebræ, 24; hind foot, 19. (Bangs, l. c.)

575. anastasiae. (*Scalops*), Bangs, Proc. Bost. Soc. Nat. Hist., 1898, p. 212.

Type locality. Anastasia Island, Florida.

Geogr. Distr. Confined to Anastasia Island.

Genl. Char. Size of *S. a. australis*; skull short, massive; mandible heavy.

Color. Golden ochraceous, with orange markings on head, wrists and under parts. Feet and hands flesh color; tail white.

Measurements. Total length, 134-141; tail vertebræ, 19.5-22.5; hind foot, 17-18.

99. Scapanus.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{3-3}{3-3} = 44.$$

Scapanus. Pomel, Sci. Phys. Nat., 1848, ix, p. 247. Type *S. townsendi*, Bach.

Hand very broad, *os falciforme* large; palms presented outward; toes without webs; muzzle long; palate but slightly extended beyond last molar; first upper incisor large; internal basal cusps of molars narrow; bullæ complete; nostrils superior; tail short, terete, scaly, hairs scanty.

576. townsendi. (*Scalops*), Bachman, Journ. Acad. Nat. Scien. Phil., 1839, viii., pt. i, p. 58.

canadensis, Rich. (nec Cuv.), Faun. Bor. Amer., 1829, i, p. 9.

latimanus, Bach., Proc. Bost. Soc. Nat. Hist., 1843, i, p. 41.

metallesens, Cass, Proc. Acad. Nat. Scien. Phil., 1853, p. 242.

aeneus, Cass, Proc. Acad. Nat. Scien. Phil., 1854, vi, p. 299.

taeniata, Le Conte, Acad. Nat. Scien. Phil., 1854, vi, p. 327.

Type locality. "Banks of the Columbia River."

Geogr. Distr. Coast line of Washington and Oregon and north-western California to Crescent City.

Genl. Char. Size large. Tail twice as long as fore foot, latter shorter than the hind foot. Upper unicuspid equally separated; coronoid process of mandible truncated.

Color. Blackish, with purplish reflections.



FIG. 79. SCAPANUS M. TOWNSENDI.

No. 493 Field Columbian Museum Coll.

Skull nat. size.

Upper tooth rows 3 times nat. size.

Measurements. Total length, 184; tail vertebræ, 39.5; hind foot without claw, 20.5.

577. orarius. (*Scapanus*), True, Proc. U. S. Nat. Mus., 1897, p. 52.

Type locality. Shoalwater Bay, Washington.

Geogr. Distr. "Sea Coast of Washington and Oregon from Coquille River northward, and shores of Puget Sound to Sumas, British Columbia; Fort Walla Walla, Washington.

Genl. Char. Similar to *S. townsendi*, but smaller.

Color. Almost black.

Measurements. Total length, 158; tail, 30; hind foot, 20. Skull: total length, 32.8; mastoid breadth, 16; length of palate from outside of incisor, 14.3.

578. californicus. (*Scalops*), Ayres, Proc. Calif. Acad. Nat. Scien., 1855, i, p. 54.

dilatatus, True, Proc. U. S. Nat. Mus. Wash., 1894, p. 242.

Type locality. San Francisco, California.

Geogr. Distr. California west of the Coast Range and Sierra Nevada; Fort Klamath, Oregon.

Genl. Char. Size moderate. First lower incisor very short; second long and canine-like.

Color. Gray brown, more or less suffused with rust color.

Measurements. Total length, 154; tail vertebræ, 33.5; hind foot without claw, 17.

479. alpinus. (*Scapanus*), Merr. Proc. Biol. Soc. Wash., 1897, xl, p. 102.

Type locality. Crater Lake, Oregon.

Genl. Char. Similar to *S. californicus*, but larger, with longer and heavier skull.

Color. Everywhere uniform grayish plumbeous, much as in *S. californicus*, but without the brownish tinge; widely different from the blackish *S. townsendi*.

Measurements. Total length, 188; tail vertebræ, 38; hind foot, 24.5. Skull: greatest length, 37; basal length, 32; palatal length, 16.75; greatest zygomatic breadth, 13.5; mastoid breadth, 17. (Merriam l.c.)

580. truei. (*Scapanus*), Merr. Proc. Biol. Soc. Wash., 1897, xi, p. 102.

Type locality. Lake City, Modoc County, California.

Genl. Char. Similar to *S. californicus*, but paler and more plumbeous in color, and with a distinct inner cusp on last upper pre-molar.

Color. Everywhere almost clear plumbeous, with a faint darker wash on upper parts.

Measurements. Total length, 170; tail vertebræ, 34; hind foot, 21. Skull: greatest length, 34.5; basal length, 29; palatal length, 15; zygomatic breadth, 13; mastoid breadth, 16.25. (Merriam, l. c.)

581. anthonyi. (*Scapanus*), J. A. Allen, Bull. Am. Mus. Nat. Hist., 1893, v, p. 200.

Type locality. San Pedro Martir Mountains, California.

Geogr. Distr. Only known from type locality.

Genl. Char. Smaller than *S. californicus*, color darker.

Color. Almost uniform, blackish.

Measurements. Length, 135; tail, 26. Skull: extreme length, 30; basilar length, 28.5; least interorbital breadth, 7.6; greatest mastoid breadth, 15.3; lower jaw, incisor border to condyle, 22.4.

100. Parascalops.

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{4-4}{4-4}; M. \frac{3-3}{3-3} = 44.$$

Parascalops. True, U. S. Nat. Mus. Wash., 1894, p. 242. Type *Scalops breweri*, Bach.

Nostrils lateral; fore feet broad; skull depressed; bullæ annular; auricular orifice large; molars with broad internal trilobed basal lobe; head conical. Sacrum and ischium not connected by osseous bridges.

ledge; anterior nares directed obliquely upward; bullæ incomplete; palate abbreviated posteriorly; tail long, scaly; fore feet broad, possessing an *os falciforme*; hind feet elongate; nostrils encompassed by large radiating tactile processes.

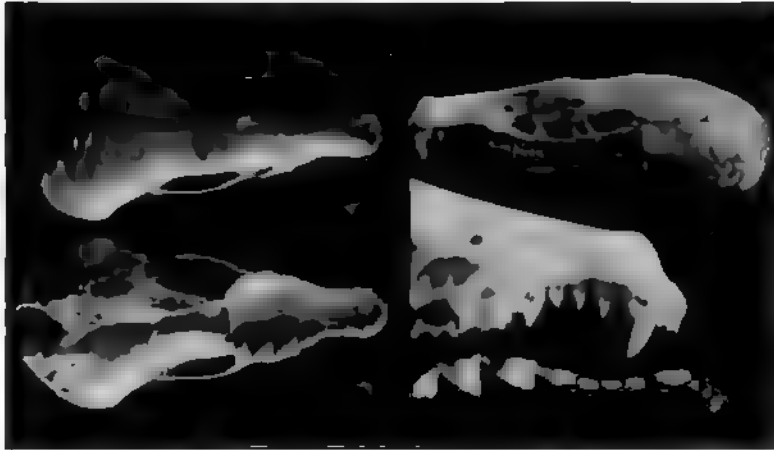


FIG. 81. *CONDYLURA CRISTATA*.
No. 377 Field Columbian Museum Coll.

Skull enlarged $\frac{1}{4}$ nat. size.

Tooth rows enlarged 5 times.

- 583. cristata.** (*Sorex*), Linn. Syst. Nat., 1758, p. 53.
longicauda, Erxl. Syst. Nat., 1797, p. 18.
canadensis, De la Faille, Naturg. Maulw., 1778, p. 3, t. 1.
radiata, Shaw, Gen. Zool. Mamm., 1800, 1, p. 523.
macroura, Harl. Faun. Amer., 1825, p. 36.
prasinata, Harris, Bost. Journ. Phil. & Arts, 1825, p. 582.
Type locality. Pennsylvania.

Geogr. Distr. Hudson Bay to Manitoba, south to Minnesota on the west, and on the Atlantic coast to South Carolina in the Alleghanies.

Genl. Char. "Size moderate; nasal cutaneous processes 22 in number, 18 marginal, and 2 pairs on nasal disk. Feet scaly; tail scaly, three-fourths as long as body, covered with scattered hairs, enlarged in winter, with a constricted base."

Color. Above dusky brown or blackish, beneath paler and grayer on sides of throat and on chin. Feet dusky. Tail blackish, slightly paler beneath.

Measurements. Average total length of 21 specimens, 170; tail vertebræ, 71.8; hind foot and claw, 27.1.

Order X. **Chiroptera.**

H. Allen. *A Monograph of the Bats of North America, 1864, 2nd ed., 1893; Bull. U. S. Nat. Mus. Wash., No. 43.*

G. E. Dobson. *Catalogue of the Chiroptera in the British Museum, 1878.*

G. S. Miller. *Revision of North American Bats of the Family Vespertilionidæ. North American Fauna, 1897, No. 13.*

Fam. I. **Vespertilionidæ.**

“Bats with turbinal bones folded, bony palate defective anteriorly, owing to the absence of palatal processes to the premaxillæ; molars with promiscuous W-shaped cusps; tail included nearly to tip in large interfemoral membrane; muzzle and nostrils variable, but former never provided with a distinct noseleaf.” (Miller.)

Sub. Fam. I. **Antrozoinæ.**

102. **Antrozous.**

$$I. \frac{1-1}{2-2}; C. \frac{1-1}{1-1}; P. \frac{1-1}{2-2}; M. \frac{3-3}{3-3} = 28.$$

Antrozous. H. Allen, Proc. Acad. Nat. Scien. Phil., 1862, p. 247.

Type *A. pallidus* (LeConte).

Muzzle truncate; nostrils surrounded by a horseshoe-shaped ridge; lower lip free in front, mammæ 2.

584. pallidus. (*Vespertilio*), LeConte, Proc. Acad. Nat. Scien. Phil., 1855, p. 437.

Type locality. El Paso, Texas.

Geogr. Distr. Desert region of eastern California, Nevada, Arizona, New Mexico and western Texas.

Genl. Char. Size large; ears large, when laid forward going beyond tip of nose; tragus straight and slender, posterior margin faintly crenulate; feet half as long as tibia; wing membranes attached at base of toes; interfemoral membrane at base of terminal caudal vertebræ. Skull: brain case, rostrum and palate broad; teeth large, strong.

Color. Above pale drab gray or fawn, tips of hairs dusky; face dark brown; beneath grayish white; sides tinged with drab.



FIG. 82. ANTROZOUS PALLIDUS.

No. 1209 Field Columbian Museum Coll.

Skull twice nat. size.

Incisors enlarged 5 times.

Measurements. Total length, 105-115; tail vertebrae, 44.6-46; tibia, 20-21; foot, 10; forearm, 49-57; thumb, 8.3-9; longest finger, 85-92; ear from tragus, 28-30; width of ear, 18.4-20; tragus, 11.6-14.

α.—pacifcus. (*Antrozous*), Merriam, Proc. Biol. Soc. Wash., 1897, xi, p. 180.

Type locality. Old Fort Tejon, Cañada de las Uvas, California.

Geogr. Distr. West of Rocky Mountains south to Lower California.

Genl. Char. Similar to *A. pallidus*, but slightly larger. Skull: brain case, rostrum and bony palate narrower; supraoccipital more pointed and overhanging; teeth larger.

Color. Above yellowish drab ("ochraceous buff, washed with dusky," type), hair tipped with dusky; beneath yellowish drab brown.

Measurements. Total length, 114-118; tail vertebrae, 46.7-47.8; tibia, 20-22.6; foot, 10.8-12; thumb, 9-10; longest finger, 91-96.

Sub. Fam. II. **Plecotinae.****103. Euderma.**

$$I. \frac{2-2}{3-3}; C. \frac{1-1}{1-1}; P. \frac{1-1}{2-2}; M. \frac{3-3}{3-3} = 32.$$

***Euderma.** H. Allen, Proc. Acad. Nat. Scien. Phil., 1891, p. 467.

Type *Histiotus maculatus*, J. A. Allen.

Histiotus, J. A. Allen, (nec Gerv.) Bull. Am. Mus. Nat. Hist., 1891, p. 195.

Ears very large, joined across forehead; posterior base of tragus united with external basal lobe. No glandular swellings on face.

585. maculata. (*Histiotus*), J. A. Allen, Bull. Am. Mus. Nat. Hist., 1891, p. 195.

Type locality. Near Piru, Ventura County, California, mouth of Castac Creek.

Geogr. Distr. Known from type locality only.

Genl. Char. Size large; ears about three-fourths as long as forearm. Skull: thin and papery; facial portion narrow and pointed; brain case quadrate, above flat, frontal border elevated; forehead depressed; bullæ very large, equalling one-third length of skull; teeth small and weak.

Color. Above, the hairs black to base; patch on shoulders and rump white; posterior base of ears, throat and sides of fore neck white, hairs dusky at base; ventral surface white, black bases of hair showing through; ears and membranes light brown.

Measurements. Total length, 110; tail vertebræ, 50; tibia, 21; foot, 9; forearm, 50; thumb, 6.8; longest finger, 91; width of ear, 22; tragus, 13; greatest width of tragus, 5.

104. Corynorhinus.

$$I. \frac{2-2}{3-3}; C. \frac{1-1}{1-1}; P. \frac{2-2}{3-3}; M. \frac{3-3}{3-3} = 36.$$

Corynorhinus. H. Allen, Proc. Acad. Nat. Scien. Phil., 1865, p. 173.

Plecotus, LeConte, (nec Geoff.) McMurt. Cuv. Anim. King., 1831, 1, App., p. 431.

Synotus, H. Allen, (nec Keyserl. & Blas.) Mon. N. Am. Bats, 1864, p. 62.

Ears large, joined across forehead, tragus free from external lobe; thick ridge ending in club-shaped enlargement between the eye and nostril. Skull slender, arched; rostrum, small, weak.

*Skull having been lost, I regret I am unable to give a figure to illustrate this genus.

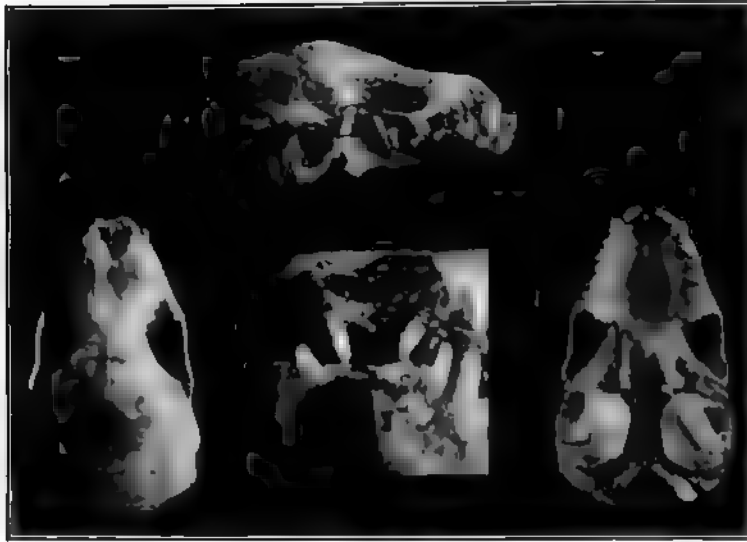


FIG. 83. CORYNORHINUS TOWNSENDI.

No. 7632 Am. Mus. Nat. Hist. Coll.

Skull enlarged $2\frac{1}{2}$ times.

Incisors enlarged 8 times.

586. macrotis. (*Plecotus*), LeConte, *McMurtr. Am. ed. Cuv. Anim. King.*, 1831, 1, App., p. 431.

lecontei, (*Plecotus*), Cooper, *Ann. N. Y. Lyc. Nat. Hist.*, 1837, iv, p. 72.

Type locality. Probably LeConte's plantation, near Riceboro, Georgia.

Geogr. Distr. South Atlantic States to Louisiana.

Genl. Char. Size large, ears very large; tragus simple, basal lobe large, free from auricle.

Color. Above yellowish brown, fur sepia at base, tips pale; throat and chest tinged with yellowish; beneath grayish white; ears and membranes light brown.

Measurements. Total length, 105-106; tail vertebræ, 48.5-52; tibia, 21.6-22; foot, 9.4-10; forearm, 41-43.4; thumb, 7-7.5; longest finger, 73-77; ear from meatus, 32; width of ear, 23; tragus, 14.

α.—pallidus. Miller, *N. Am. Faun.*, No. 13, 1897, p. 52.

townsendi, (*Synotus*), H. Allen, (nec Cooper), *Mon. N. Am. Bats*, 1893, p. 58.

Type locality. Keam Cañon, Navajo County, Arizona.

Geogr. Distr. California, Colorado and western Texas, to southern Mexico.

Genl. Char. Similar to *C. macrotis*, but paler.

Color. Back yellowish drab gray, head paler, base of hairs light plumbeous; beneath paler than back; ears and membranes light brown.

Measurements. Total length, 90–105; tail vertebræ, 45–49; tibia, 19–21; foot, 9–9.6; forearm, 41.9–44; thumb, 5–7; longest finger, 71–77; ear from meatus, 33–33.9; width of ear, 20–23.7; tragus, 12.7–14.6.

b.—townsendi. (*Plecotus*), Cooper, (nec Allen), Ann. Lyc. Nat. Hist. N. Y., iv, p. 73.

macrotis, Dobs. Cat. Chiropt. Brit. Mus., 1878, p. 180, (nec LeConte).

Type locality. Columbia River, Oregon.

Geogr. Distr. Humid coast district of Oregon, Washington and southern British Columbia.

Genl. Char. Similar to typical *C. macrotis* but much darker, fur nowhere distinctly bicolor.

Color. Above dark brown, hairs at base light plumbeous, tips pale yellowish; beneath dark brown; ears and membrane blackish.

Measurements. Total length, 100–105; tail vertebræ, 48–51; tibia, 21.4–22; foot, 9.4–10; forearm, 42–44; thumb, 6.6–7; longest finger, 76–80; ear from meatus, 33–34; width of ear, 21–24; tragus, 14–15.

Sub. Fam. III. Vespertilioninae.

105. Myotis.

$$I. \frac{2-2}{3-3}; C. \frac{1-1}{1-1}; P. \frac{3-3}{3-3}; M. \frac{3-3}{3-3} = 38.$$

Myotis. Kaup, Skizzirte Entw. Gesch. u. Naturl. Syst. d. Europ. Thierw., 1829, 1, p. 106. Type *V. murinus*, Schreb. (nec Linn.).

Mystactes, Kaup, Skizzirte Entw. Gesch. u. Naturl. Syst. d. Europ. Thierw., 1829, 1, p. 108.

Vespertilio, Keyserl. & Blas. (nec Linn.), Wieg. Archiv. Naturg., 1839, 1, p. 306.

Selysius, Bonp. Icon. Faun. Ital., 1841, Introd., p. 3.

Brachyotus, Kolenati, Allgem. Deutsch. Naturh. Zeitg., Dresden, Neue Folge, 1856, 11, pp. 131, 174.

Isotus, Kolenati, Allgem. Deutsch. Naturh. Zeitg., Dresden, Neue Folge, 1856, pp. 131, 144.

Acorestes, Fitzing. Sitzung. Math.—Nat. Cl. K. Akad. Wiss., Wien, 1870 lxii, abth., 1, p. 427.

Comastes, Fitzing. Sitzung., Math. Nat. Cl. K. Akad. Wiss., Wien, 1878, abth. 1, p. 565.

Form slender; tail long, face hairy, ears narrow; tragus, tapering, straight or recurved; dental formula characteristic.



FIG. 84. MYOTIS LUCIFUGUS.

No. 256 Field Columbian Museum Coll.

Skull enlarged 3 times.

Incisors enlarged 10 times.

587. vellifer. (*Vespertilio*), J. A. Allen, Bull. Am. Mus., 1890, p. 177.

incantus, J. A. Allen, Bull. Am. Mus., 1896, p. 239.

Type locality. Santa Cruz del Valle near Guadalajara, Jalisco, Mexico.

Geogr. Distr. From Missouri and Indian Territory, south to Hidalgo, northern Michoacan, and the city of Mexico.

Genl. Char. Largest species of *Myotis* known in the United States. Calcar slender, lobe not well developed. Wings from metatarsus. Free border of uropatagium naked. Ears short, reaching tip of nose.

Skull. Strong and heavily built, but not larger than *M. thysanodes*. Greatest length, 16-16.4; zygomatic breadth, 10-11; interorbital constriction, 4-4.2; width of rostrum at anterior root of first upper molar, 6-6.2; length of mandible, 12-13.

Color. Fur dull sepia throughout, paler on the belly, dusky slate at base. Belly usually dull broccoli brown, sometimes tinged with yellow, and then is nearly isabella color.

Measurements. Total length, 99; tail, 44.8; tibia, 18.5; foot, 9.5.

forearm, 40-47; thumb, 7.2; longest finger, 73.4; ear from meatus, 16; width of ear, 10.6; tragus, 9.

588. lucifugus. (*Vespertilio*), Le Conte, *McMurtr. Cuv. Anim. King.*, 1831, 1, App., p. 431.

subulatus, Le Conte, *Proc. Acad. Nat. Scien. Phil.*, 1854-55, p. 435.

affinis, J. H. Allen, *Mon. N. Am. Bats*, p. 53.

carolii, Dobson, *Cat. Chirop. Brit. Mus.*, p. 325.

austroriparius, Rhoads, *Proc. Acad. Nat. Scien. Phil.*, 1897, p. 227.

Type locality. South portion of Liberty County, Georgia.

Geogr. Distr. North America east of the Rocky Mountains.

Genl. Char. Calcar slender; in length equal to free border of uropatagium, which is naked; upper incisors bilobate; nose subbilobate; face with a naked prominence on either side; ears short, pointed; tragus sublinear, anterior border straight; tail projecting a little beyond membrane; wings attached at the base of toes. Skull, nasals and palate broad; forehead sloping; brain case broad posteriorly, contracted anteriorly, outline slightly wedge-shaped.

Color. Upper parts dull brown, beneath pale wood brown tinged with gray or yellowish. The shades of brown vary considerably.

Measurements. Total length, 83.5-89.5; tail vertebræ, 37.6-40; tibia, 15.5-16.1; foot, 7.3-9.1; forearm, 36.1-38.9; thumb, 6.6-6.7; longest finger, 60.2-63.7; ear from meatus, 12.2-13.7; width of ear, 9.1-9.7; tragus, 7.1-8.

a.—alascensis. (*Myotis*), Miller, *N. Am. Faun.*, No. 13, 1897, p. 63.

Type locality. Sitka, Alaska?

Geogr. Distr. Coast district of southern Alaska and northern British Columbia.

Genl. Char. Similar to *M. lucifugus*, but darker; ears longer.

Color. Specimens being all in alcohol, the exact color could not be determined, but they were evidently darker than *M. lucifugus*. Ears and membrane blackish. (Miller.)

Measurements. Total length, 80-91; tail vertebræ, 35-39; tibia, 15-16; foot, 8-9; forearm, 34.6-38; thumb, 6-2; longest finger, 57.6-60; ear from meatus, 14.8-16; width of ear, 8.9-10.6; tragus, 7-7.6.

b.—longicrus. (*Vespertilio*), True, *Science*, 1886, viii, p. 588.

albescens, H. Allen, *Mon. Bats N. Am.*, 1893, p. 92.

Type locality. Puget Sound.

Geogr. Distr. Puget Sound east to Wyoming, south to southern California and Arizona.

Genl. Char. Similar to *M. lucifugus*, but larger.

Color. No appreciable difference in the color of this form and *M. lucifugus*.

Measurements. Total length, 93.5–102; tail vertebræ, 41–46; tibia, 17.3–19.6; foot, 17.4–18.4; forearm, 38–40; thumb, 5.5–7; longest finger, 65–71; ear from meatus, 12–13.5; width of ear, 9–10; tragus, 7–8.2.

589. yumanensis. (*Vespertilio*), H. Allen, Mon. N. Am. Bats, 1864, p. 58.

macropus, H. Allen, Proc. Acad. Nat. Scien. Phil., 1866, p. 288.

nitidus, H. Allen, Mon. N. Am. Bats, 1893, p. 87.

Type locality. Old Fort Yuma, California.

Geogr. Distr. Southwestern United States into Mexico.

Genl. Char. Size small; calcar distinct, considerably longer than free border of interfemoral membrane, terminating in a well-marked lobule; free border of uropatagium naked; ears moderate; wings from base of toes, but on account of extent of web between toes apparently from side of metatarsus; feet very large and strong as compared with other small American species. (Miller.)

Color. Above pale wood brown, beneath dirty whitish; fur light plumbeous at base, ears and membrane light brown, those of the wings and uropatagium with white edges.

Measurements. Total length, 70.2–83.7; tail vertebræ, 34.9–36.7; tibia, 14.1–15.7; foot, 7.9–8.8; forearm, 33.9–34.4; thumb, 5.2–6.5; longest finger, 55.5–57.8; ear from meatus, 14–14.4; width of ear, 8.2–9.1; tragus, 7–7.6.

a.—saturatus. (*Myotis*), Miller, N. Am. Fauna., No. 13, 1897, p. 68.

Type locality. Hamilton, Washington.

Geogr. Distr. Oregon, Washington and British Columbia.

Genl. Char. Similar to *M. yumanensis*, but darker.

Color. Back dark yellowish brown; chin, throat and sides darker than belly; ear and membranes blackish; beneath isabella.

Measurements. Total length, 77–82.3; tail vertebræ, 30–36.5; tibia, 14–15; foot, 8.3–8.6; forearm, 33–35.3; thumb, 5–6; longest finger, 57–59.3; ear from meatus, 14.3; width of ear, 8.9; tragus, 7.

590. californicus. (*Vespertilio*), Aud. & Bach. Journ. Acad. Nat. Scien. Phil., 1842, p. 20.

nitidus, H. Allen, Proc. Acad. Nat. Scien. Phil., 1862, p. 247.
(nec 1893 Mon. Bats.)

oregonensis, H. Allen, Mon. N. Am. Bats, 1864, p. 61.

obscurus, H. Allen, Proc. Acad. Nat. Scien. Phil., 1866, p. 281.

volans, H. Allen, Proc. Acad. Nat. Scien. Phil., 1866, p. 282.

exilis, H. Allen, Proc. Acad. Nat. Scien. Phil., 1866, p. 283.

tenuidorsalis, H. Allen, Proc. Acad. Nat. Scien. Phil., 1866, p. 283.

yumanensis, H. Allen, Proc. Acad. Nat. Scien. Phil., 1866, p. 283. (nec H. Allen, 1864.)

melanorhinus, Merriam, N. Am. Faun, No. 3, 1890, p. 46.

henshawi, H. Allen, Mon. Bats N. Am., 1893, p. 103.

nigricans, H. Allen, Mon. Bats N. Am., 1893, p. 97 (note). (nec Max.)

Type locality. California.

Geogr. Distr. Western United States and Lower California, east to Wyoming and Texas.

Genl. Char. Size very small, calcar very slender, lobule at tips equal to free border of uropatagium which is naked; ears reaching beyond end of nose; wings from base of toes. Skull: superior outline sloping gradually anteriorly to nasals; teeth feeble.

Color. Above yellowish brown, beneath paler; fur plumbeous at base.

Measurements. Total length, 77.8–82; tail vertebræ, 38.8–39; tibia, 13.9–14.4; foot, 5.4–6; forearm, 31–32; thumb, 4–4.2; longest finger, 55.4–58; ear from meatus, 12.9–14.2; width of ear, 9.9–10; tragus, 7.5–8.3.

a.—caurinus. (*Myotis*), Miller, N. Am. Fauna, 13, 1897, p. 72.

Type locality. Massett, Queen Charlotte Islands, British Columbia.

Geogr. Distr. Humid coast districts of British Columbia, Washington and Oregon, possibly northern California.

Genl. Char. Similar to typical *M. californicus*, but very much darker in color.

Color. Above blackish sepia, beneath slightly yellowish; the fur everywhere blackish plumbeous at base.

Measurements. Total length, 75–77; tail vertebræ, 34; tibia, 13.8–14; foot, 6.1–7; forearm, 32; thumb, 4.3–5; longest finger, 54; ear from meatus, 12.8–13.2; width of ear, 8–9.5; tragus, 7.

b.—ciliolabrum. (*Myotis*), Merr., Proc. Biol. Soc. Wash., 1886, iv, p. 1.

Type locality. Trego County, Kansas.

Geogr. Distr. Kansas and central southern Dakota, limits of range unknown.

Genl. Char. Similar to *M. californicus*, but paler.

Color. General hue pale yellowish white; ears, muzzle and chin dark brown, membranes light brown, edges paler.

Measurements. Total length, 75–80.2; tail vertebræ, 34–36.7;

tibia, 14.6–15; foot, 6.8–7; forearm, 32.8–33; thumb, 5.4–6; longest finger, 57–59; ear from meatus, 14–14.6; width of ear, 9–10; tragus, 8.5–8.8.

d.—pallidus. Stephens, Proc. Biol. Soc. Wash., 1900, p. 153.

Type locality. Vallecito, San Diego County, California.

Genl. Char. "Size small; wings short, wing membrane thin and light; ears small; general appearance delicate.

Color. Light ochraceous buff or brownish cream buff; below dull white; basal part of pelage above and below blackish."

Measurements. "Total length, 80; expanse, 208; tail vertebræ, 42; ear, 11; thumb, 4; forearm, 30; tibia, 15." (Stephens, l. c.)

591. subulatus. (*Vespertilio*), Say, in Long's Exped. Rocky Mts., 1823, 11, p. 65.

gryphus, var. b., H. Allen, Mon. Bats N. Am. 1897, p. 131.

gryphus, var. septentrionalis, Trouess. Cat. Mamm. t. Viv. q. Foss., 1897, p. 131.

Type locality. Arkansas River, near La Junta, Colorado.

Geogr. Distr. North America east of Rocky Mountains.

Genl. Char. Size medium; calcar slender, a little longer than the border of uropatagium, with a lobule at the end; ears long, reaching beyond tip of nose. Wings from base of toes. Teeth and skull like *M. evotis*.

Color. Apparently not distinguishable from *M. lucifugus* in its general coloration, the difference being that this form has a "narrower skull, longer ears, and a more shapely pointed tragus."

Measurements. Total length, 80–85.6; tail vertebræ, 36.8–38.8; tibia, 16.4–17.2; foot, 7.5–8; forearm, 33.8–35.7; thumb, 6.2–6.5; longest finger, 58–61; ear from meatus, 15.6–16.7; width of ear, 9.8–10.7; tragus, 9–9.7.

a.—keenii. (*Vespertilio*), Merr., Am. Nat., 1895, xxix, p. 860.

Type locality. Massett, Queen Charlotte Islands, British Columbia.

Geogr. Distr. Known from type locality only.

Genl. Char. Size of *M. subulatus*, but with longer ears and tail, and darker in color.

Color. Apparently darker than *M. subulatus*, but as all known specimens have been preserved in alcohol the exact color is impossible to be ascertained.

Measurements. Total length, 84.3–86; tail vertebræ, 40–41; tibia, 16.4; foot, 8.3–8.8; forearm, 35.3–36; thumb, 6; longest finger, 58–60; ear from meatus, 17.4–17.8; width of ear, 10.8–11; tragus, 9.6–9.8.

592. evotis. (*Vespertilio*). H. Allen. Mon. Bats N. Amer., 1864, p. 48.

albescens evotis, Dobson. Cat. Chiropt. Brit. Mus., 1878, p. 324.

chrysonotis, J. A. Allen, Bull. Am. Mus. Nat. Hist, 1896, p. 240.

Type locality. Not given. possibly Monterey, California.

Geogr. Distr. Pacific coast to eastern edge of Rocky Mountains, south to Vera Cruz.

Genl. Char. Size large. calcar longer than free border of uropatagium. and a lobule at tip; ears reaching beyond tip of nose. Wing membrane from base of foot.

Color. Light yellowish brown. hairs dusky slate at base; ventral surface paler. Color among individuals varies considerably.

Measurements. Total length, 85-92; tail vertebræ, 41-43; tibia, 17.6-20; foot, 7-9; thumb, 6-8; longest finger, 62-67; ear from meatus, 19.4-23; width of ear, 11.8-14.6; tragus, 10.8-13.

b.—thysanodes. (*Myotis*), Miller, N. Am. Faun., No. 13, 1897, p. 80.

albescens evotis and *albescens relicifer* (*Vespertilio*), H. Allen, Mon. N. Am. Bats. 1893, pp. 90 and 93.

Type locality. Old Fort Tejon, California.

Geogr. Distr. Southern border of western United States to San Luis Potosi and Michoacan.

Genl. Char. Size large, calcar distinct, usually terminating in a well marked pointed projection. Free border of uropatagium thickened and densely haired. Ears moderately long; laid forward they reach 3-5 mm. beyond nostril. Wings from point between ankle and base of toes, but nearer latter.

Color. Everywhere light dull yellowish brown, distinctly paler ventrally, the hairs everywhere dusky slate at base. The palest specimens are yellowish wood brown, inclining to clay color; the darkest specimens dull raw umber. The belly varies from clear gray scarcely tinged with yellow to a strong yellowish gray, and in other specimens to dull brownish gray.

Measurements. Average from 11 specimens from Old Fort Tejon give total length, 85-95; tail vertebræ, 36-37; tibia, 16.4-18; foot, 8-8.9; forearm, 40-46; thumb, 6-6.7; longest finger, 69-73.6; ear from meatus, 16-18.5; width of ear, 11.8-12; tragus, 10.5-11. (Miller, l. c.)

106. Lasionycteris.

$$I. \frac{2}{3}; C. \frac{17}{11}; P. \frac{27}{33}; M. \frac{37}{33} = 36.$$

Lasionycteris. Peters, Monat. K. Akad. Wissensch., Berlin, 1865, p. 68. Type *Vespertilio noctivigans*, LeConte.

Scotophilus, H. Allen, (nec Leach), Mon. N. Am. Bats, 1864, p. 27.

Cnephaiophilus, Fitzin. Sitzung. K. Akad. Wissench. Wien., 1870, lxii, abth. 1, p. 8.

Vesperides, Coues, Coues & Yarrow, Zool. Wheeler Exp., 1875, p. 83.

Vesperugo, Dobson, Cat. Chiropt. Brit. Mus. 1878, p. 183 (Part).

Superior outline of skull almost straight; occiput angular; no sagittal crest; rostrum very broad, concave behind nasal opening; orbital constriction considerable; ear short, not so broad as long; basal lobe large; tragus short and straight, rounded at tip. Basal half of interfemoral membrane on the back furred.

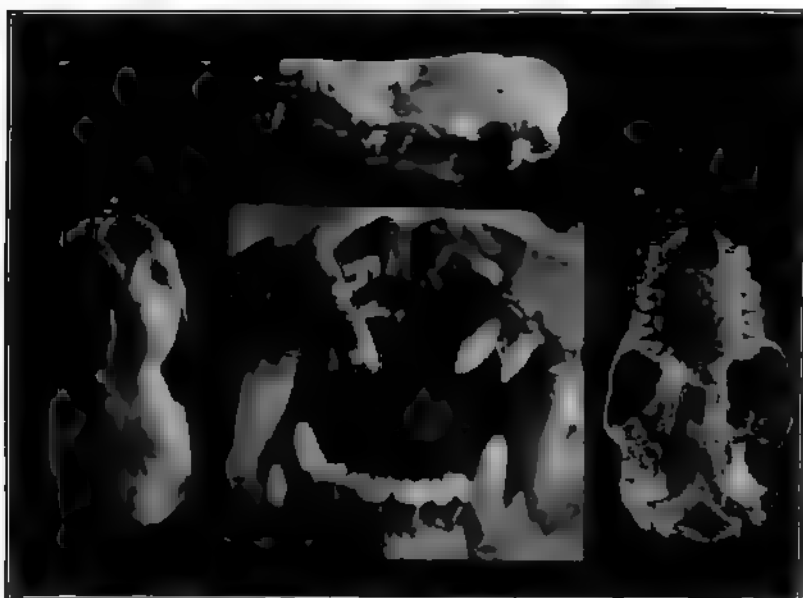


FIG. 85. LASIONYCTERIS NOCTIVAGANS.

No. 6618 Field Columbian Museum Coll.

Skull enlarged $2\frac{1}{2}$ times.

Incisors enlarged 9 times.

593. *noctivagans*. (*Vespertilio*), LeConte, McMurtr. Cuv. Anim. King., Am. ed., 1831, p. 31.

auduboni, Harlan, Am. Month. Journ. Geol. & Nat. Hist., 1831, p. 31.

pulverulentus, Temm. Monogr. Mamm., 11, 1835, p. 325.

Type locality. Eastern United States.

Geogr. Distr. North America from the Atlantic to the Pacific.

Genl. Char. Same as those of the genus.

Color. Blackish chocolate brown, hairs tipped with silvery

white on the back, belly and fur of interfemoral membrane; largest amount of white on middle of back.

Measurements. "Total length, 95-105.8; tail vertebrae, 38-44; tibia, 15-17; foot, 7-8; forearm, 39-43; thumb, 4.3-6.2; longest finger, 68-75; ear from meatus, 15.4-16; width of ear, 11-14.1; tragus, 5.6-6.7." (Miller.)

107. *Pipistrellus*.

I. $\frac{2-2}{3-3}$; C. $\frac{1-1}{1-1}$; P. $\frac{2-2}{2-2}$; M. $\frac{3-3}{3-3}$ = 34.

Pipistrellus. Kaup. Skizzirte Entwick-Gesch. u. Naturh. Syst. d. Europ. Thierw., 1829, Th. 1, p. 98. Type. *Vespertilio pipistrellus*, Schreb.

Vesperugo, Keyserl. & Blas. Wieg. Archiv. f. Naturg., 5 ter Jahrg., 1839, Bd. 1, p. 312 (Part).

Nannugo, Kolenati, Allgem. Deutsch. Naturhist. Zeitg., Dresden, Neue Folge, 1856, 11, pp. 131, 169.

Hypsugo, Kolenati, Allgem. Deutsch. Naturhist. Zeitg., Dresden, Neue Folge, 1856, 11, pp. 131, 169.

Scotophilus, H. Allen (nec Leach), Mon. N. Am. Bats, 1864, p. 27.

Skull light, brain-case inflated; rostrum broad; ears longer than broad, tapering, tip rounded; tragus straight; interfemoral membrane behind with hair on basal third; mammae two.

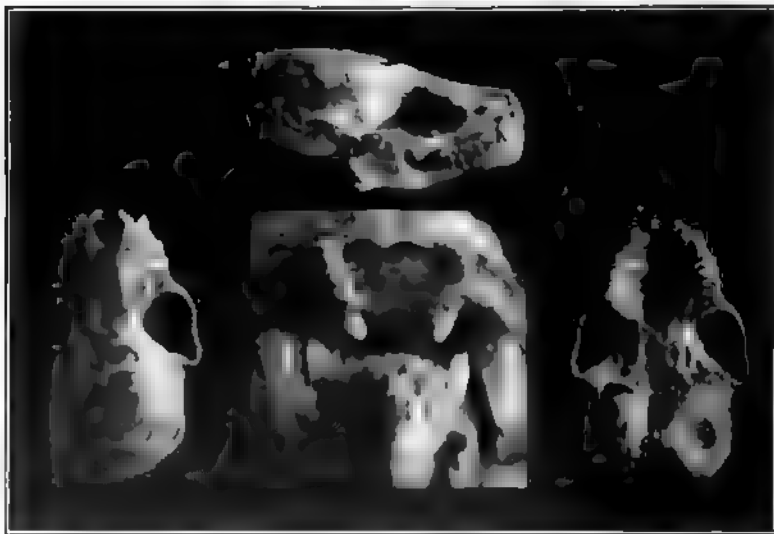


FIG. 86. *PIPISTRELLUS HESPERUS*.

No. 5045 Field Columbian Museum Coll.

Skull enlarged 3 times.

Incisors enlarged 10 times.

594. hesperus. (*Scotophilus*), H. Allen, Mon. N. Am. Bats, 1861, p. 43.

merriami, Dobson, Cat. Chiropt. Brit. Mus. 1878, p. 228.

Type locality. Fort Turner, California.

Geogr. Distr. Western Texas and the Pacific coast.

Genl. Char. Size small, ear reaching to nostril, short and rounded at tip; tragus curved forward at tip; end of tail free of membrane.

Color. Light yellowish gray, hairs plumbeous at base; border of wing membrane between fourth and fifth finger whitish; ears, face, muzzle and membrane black.

Measurements. Total length, 72.8–79; tail vertebræ, 28–34.5; tibia, 11–12.8; foot, 5–6; forearm, 28–32.5; thumb, 4; longest finger, 48–55.5; ear from meatus, 10–12.4; width of ear, 8.6–9.6; tragus, 4.6–5.4.

595. subflavus. (*Vespertilio*), F. Cuv. Nouv. Ann. Hist. Nat., Paris, 1832, p. 17.

erythrodactylus, Temm. Mon. Mamm., 1835–41, 11, p. 238.

carolinensis (nec Geoff.), Ann. Mus., 1806, viii, p. 193.

Type locality. Eastern United States, possibly Georgia.

Geogr. Distr. Atlantic coast west to Iowa, south to eastern and southern Texas.

Genl. Char. Size small; thumb long; ear reaching beyond nostrils; tragus straight, tip rounded; end of tail free of membrane, fur tri-color.

Color. Above dark yellowish brown; beneath paler; fur plumbeous at base. Wide variation of color among individuals.

Measurements. Total length, 84.6–85; tail vertebræ, 37.8–40.7; tibia, 15.2–16; foot, 7.8–8.1; forearm, 33.7–34.6; thumb, 6.8; longest finger, 60–62.8; ear from meatus, 13.9–14.2; width of ear, 9.5–9.8; tragus, 6.4–6.6.

a.—obscurus. (*Myotis*), Miller, N. Am. Fauna, No. 13, 1897, p. 93.

Type locality. Lake George, Warren County, N. Y.

Geogr. Distr. Only known from type locality.

Genl. Char. Equal to *M. subflavus* in size; color duller and less yellow, tips of hairs on back less conspicuous.

Color. Above pale wood brown; beneath isabella color; base of fur everywhere blackish slate.

Measurements. Total length, 84.8; tail vertebræ, 38.9; tibia, 15.2; foot, 2.8; forearm, 36; thumb, 6.8; longest finger, 60.6; ear from meatus, 14; width of ear, 10; tragus, 6.8.

108. *Vespertilio*.

$$I. \frac{2-2}{3-3}; C. \frac{1-1}{1-1}; P. \frac{1-1}{2-2}; M. \frac{3-3}{3-3} = 32.$$

Vespertilio. Linn. Syst. Nat., 1758, 1, p. 31. Type. *Vespertilio murinus*, Linn. (nec Schreb.)

Eptesicus, Rafin. Ann. Nat., 1820, p. 2.

Cnephaeus, Kaup, Skizzirte. Entw.-Gesch. u. Naturl. Syst. Eur. Thier., 1829, 1, p. 103.

Vesperugo, Keyserl. & Blas. Wieg. Arch. f. Naturg., 1839, Bd. 1, p. 312 (Part.)

Vesperus, Keyserl. & Blas. Wieg. Arch. f. Naturg., 1839, Bd. 1, p. 313.

Noctula, Bonp. Iconog. Faun. Ital., 1841, 1, fasc. xxi.

Cateorus, Kolenati, Allgem. Deutsch. Naturh. Zeitg., Dresden, Neue Folge, 1856, 11, pp. 121, 162.

Meteoros, Kolenati; Allgem. Deutsch. Naturh. Zeitg., Dresden, Neue Folge, 1856, 11, pp. 131, 167.

Adelonycteris, H. Allen, Proc. Acad. Nat. Scien. Phil., 1891, p. 466.

Skull large, superior outline nearly straight, occiput angular, sagittal crest present; rostrum broad, slightly concave back of nasal opening; ear short, narrower than long, with basal lobe; tragus straight, directed forward, pointed. Only few hairs on back of interfemoral membrane.

596. fuscus. (*Vespertilio*), Beauvois, Cat. Peale's Mus., 1796, p. 14. *carolinensis*, Geoff. Ann. Mus. Hist. Nat., 1806, p. 193.

phaiops, Rafin. Am. Month. Mag., 1818, 111, p. 445.

melanops, Rafin. Ann. Nat., 1820, p. 2.

arquatus, Say, in Long's Exp. Rocky Mts., 1823, 1, p. 167 (note).

ursinus, Temm. Mon. Mamm., 1835, 11, p. 235.

greenii, Gray, List Spec. Mamm. Brit. Mus., p. 30.

scrocinus, var. *V. fuscus*, Dobson, Cat. Chiropt. Brit. Mus., 1878, p. 192.

Type locality. Philadelphia, Pa.

Geogr. Distr. Austral, Transition and (lower edge of) Boreal zones throughout the United States and adjoining British provinces. (Miller.)

Genl. Char. Size large; ears short; membrane, heavy, thick; foot half as long as tibia; wing membranes attached beyond base of toes, naked save a few hairs on under side of interfemoral membrane and wings, near humerus and forearm.

Color. Above bistre or sepia; paler beneath.



FIG. 87. VESPERTILIO FUSCUS.
No. 1131 Field Columbian Museum Coll.

Skull twice nat. size.

Incisors enlarged 7 times.

Measurements. Total length, 108.5-116; tail vertebræ, 42-47.5; tibia, 19.1-19.7; foot, 9.2-10.4; forearm, 44.8-47; thumb, 6-7; longest finger, 79.4-82; ear from meatus, 17-19.5; width of ear, 12-13.3; tragus, 7.8-8.3.

109. Lasiurus.

I. $\frac{1-1}{3-3}$; C. $\frac{1-1}{1-1}$; P. $\frac{2-2}{2-2}$; M. $\frac{3-3}{3-3} = 32$.

Lasiurus. Gray, Zool. Misc., 1831, No. 1, p. 38.

Atalapha. Peters, Monat. K. Akad. Wiss. Berlin, 1870, p. 907.
(nec Rafin.)

Small premolar at base of upper incisor on inner side, incisor in contact with canine; ear broad, rounded at tip, hairy; back of inter-femoral membrane thickly furred; skull broad.

- 597. borealis.** (*Vespertilio*), Mull. Natursgat., Suppl., 1776, p. 21.
noveboracensis, Erxleb., Syst. Regn. Anim., 1777, 1, p. 155.
lasiurus, Schreb., Säugth. Abth., 1781, 1, Taf. lxii B.
noveboracus, Bodd., Elench. Anim., 1785, 1, p. 71.

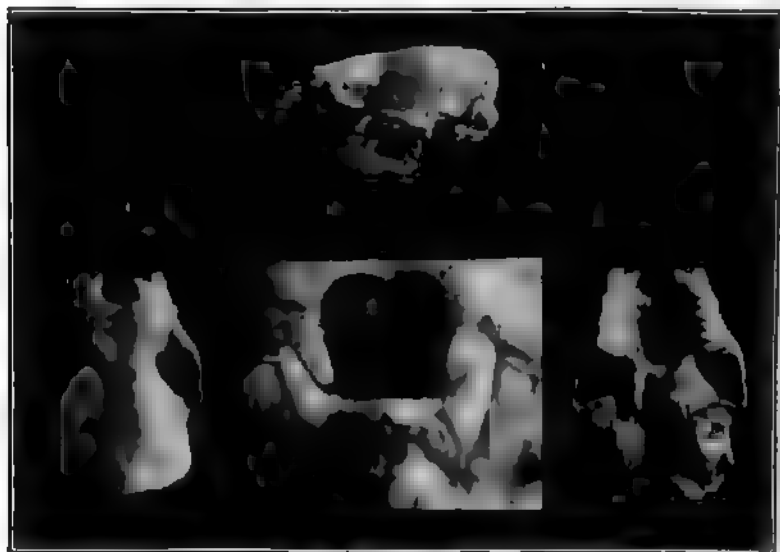


FIG. 88. LASIURUS BOREALIS.
No. 6620 Field Columbian Museum Coll.

Skull twice nat. size.

Incisors enlarged 7 times.

rubellus, Beauvois, Cat. Peale's Mus., 1796, p. 204.

rubra, Ord, Guthr. Geog., 2d Am. ed. 1815, 11, p. 291.

tesselatus, Rafin., Am. Month. Mag., 1818, 111, p. 445.

monachus, Rafin., Am. Month. Mag., 1818, 111, p. 445.

rufus, Warden, Desc. Etats Unis Am., Sept. 1820, v, p. 606.

funeris, Fitzin., Sitzun. K. Akad. Wiss. Wien, 1870, lxii,
p. 46.

Type locality. New York State.

Geogr. Distr. Eastern North America from Canada to Florida,
Colorado, Indian Territory and Texas.

Genl. Char. Size small, ears reaching half way between angle
of mouth and nostril; tragus triangular; wing membranes attached
to base of toes; no fur tuft at proximal end of forearm. Skull:
rostrum broad; zygomata spreading; teeth large.

Color. Variable, ranging from yellowish red and fawn to yellowish
gray; in front of shoulders is a whitish space.

Measurements. Total length, 103-110; tail vertebræ, 47.55-52.7;
tibia, 18.6-19.6; foot, 7.4-7.9; forearm, 38.5-40.6; thumb, 6.3-7.3;
longest finger, 79.3-82.8; ear from meatus, 10-11.9; width of ear,
9.8-11.4; tragus, 6.5-7.

a.—seminolus. (*Lasiurus*), Rhoads, Proc. Acad. Nat. Scien. Phil., 1895, p. 32.

Type locality. Tarpon Springs, Florida.

Geogr. Distr. South Carolina to southern Texas.

Genl. Char. Size equal to *L. borealis*, foot larger.

Color. Body above cinnamon or mahogany brown, hairs tipped with ash; forehead, cheeks, chin and abdomen yellowish brown; throat and chest whitish; rest of under parts and hairy lower surface of wings cinnamon grading to orange brown at base of metacarpals; hairs at base sooty.

Measurements. Total length, 95–115; tail vertebræ, 45–54; tibia, 19–20; foot, 6.9–9; forearm, 40–42; thumb, 7–7.4; longest finger, 79–85; ear from meatus, 11.3–12.7; width of ear, 10–11.4; tragus, 6.5–7.

b.—teliotis. (*Atalpa*), H. Allen, Proc. Am. Phil. Soc., 1891, xxix, p. 1.

Type locality. Unknown, California?

Geogr. Distr. Sacramento Valley to Comondu, Lower California.

Genl. Char. Smaller than *L. borealis*; ear shorter, external basal lobe reduced. Back of interfemoral membrane furred on basal third.

Color. Above dark chestnut, hairs sometimes tipped with gray; beneath paler; lower half of sides of neck white.

Measurements. Total length, 96–107; tail vertebræ, 45–57; tibia, 19.6–20; foot, 6.6–8.6; forearm, 37–40; thumb, 6.4–7; longest finger, 74–82; ear from meatus, 9.4–10; width of ear, 9–9.8; tragus, 5.4–6.

598. cinereus. (*Vespertilio*), Beauvois, Cat. Peale's Mus. Phil., 1796, p. 14.

pruinus, Say, Long's Exped. Rocky Mts., 1823, 1, p. 167 (foot note).

Type locality. Philadelphia, Pennsylvania.

Geogr. Distr. North America from Atlantic to the Pacific at different seasons. Fur on forearm near base.

Genl. Char. Size large; ears with edges black; foot half as long as tibia.

Color. Above umber brown, hairs tipped with silvery white; throat, head and under side of membranes yellowish brown; band of umber brown below throat; ventral surface whitish.

Measurements. Total length, 130–140; tail vertebræ, 52–58; tibia, 23–24; foot, 9–10; forearm, 48–55; thumb, 10–10.6; longest finger, 101–110; ear from meatus, 17–18; width of ear, 15–17.7; tragus, 9–9.5.

18-24.9; foot, 8-10; forearm, 45.5-55; thumb, 6-8.9; longest finger, 95-111; ear from meatus, 17-18.8; width of ear, 14-15.5; tragus, 8-9.4.

111. *Nycticejus*.

I. $\frac{1-1}{3-3}$; C. $\frac{1-1}{1-1}$; P. $\frac{1-1}{2-2}$; M. $\frac{2-3}{3-3} = 30$.

Nycticejus. Rafin. Journ. Phys. 1819, lxxxviii, p. 417.

Nycticeyx, Wagl. Naturl. Syst. der Amphib., 1830, p. 13.

Upper incisor not in contact with canine; outer lower incisor equal to others in size, tricuspidate; uropatagium furred only at base; tips of tail free; tragus bent forward; skull narrow.



FIG. 90. *NYCTICEJUS HUMERALIS*.

No. 3010 Field Columbian Museum Coll.

Skull (twice nat size.

Incisors enlarged 8 times.

600. humeralis. (*Vespertilio*), Rafin. Amer. Month. Mag., 1818, 111, p. 445.

crepuscularis, LeConte, McMurtrie's Cuv. Anim. King., 1831, 1, p. 432.

Type locality. Kentucky.

Geogr. Distr. Eastern United States west to Arkansas and southern Texas.

Genl. Char. Size medium, ears small, thick, naked except at base; tragus short, broad, blunt; lobe at posterior base; membranes thick; uropatagium at middle of terminal caudal vertebræ.

Color. Above umber brown, beneath paler, fur at base plumbeous.

Measurements. Total length, 91.4-93.5; tail vertebrae, 35.8-37.2; tibia, 13.4-13.8; foot, 6.7-7.7; forearm, 34.3-36.4; thumb, 5.3-5.6; longest finger, 63.4-65.2; ear from meatus, 12.7-13.9; width of ear, 8.8-10.5; tragus, 5.1-6.2.

112. *Nyctinomus*.

I. $\frac{1-1}{3-3}$ or $\frac{1-1}{2-2}$; C. $\frac{1-1}{1-1}$; P. $\frac{2-2}{2-2}$ or $\frac{1-1}{2-2}$; M. $\frac{3-3}{3-3} = 32$ or 28.

Nyctinomus. Geoff. Descr. de l'Égypte, 1812, 11, p. 114.

Dinops, Savi, Nuov. Giorn. di Lett., 1825, p. 230.

Dysopes, Cretzsch. (nec Illig.) Rupp. Ath. Reis. Nordl. Afr. Zool., 1826, p. 69.

Ears close together at base of inner margins; tragus short, rounded above; muzzle projecting beyond lower lip, broad obliquely truncated; upper lip grooved with vertical wrinkles, expansive; first and fifth toes thickest, long curved hairs on back of all the toes; premaxillae separate in front, or joined only by cartilage; upper incisor at base in contact with canine, the cusps converging inwards and forwards.



FIG. 91. *NYCTINOMUS BRASILIENSIS*.

No. 665 Field Columbian Museum Coll.

Skull twice nat size

Incisors enlarged 7 times.

a.—*macrotis nevadensis*. (*Nyctinomus*), H. Allen, Mon. Bats, N. Am., 1893, p. 171.

Type locality. Nevada.

Geogr. Distr. Nevada and California.

Genl. Char. Tragus convex; no naked space on endopatagium near the body. Keel of auricle not projecting beyond antitragus. (H. Allen.)

Color. Above mouse color, beneath lighter.

Measurements. Head and body, 60; arm, 25; forearm, 54.

601. *brasiliensis*. (*Nyctinomus*), Geoff. Ann. Scien. Nat., 1824, 1, p. 337.

nasutus, Spix. Sim. et Vesp. Bras., 1823, p. 60, pl. xxxv, fig. 7.

murinus, Gray, Griff. Cuv. Anim. King., 1828, v, p. 66.

cynocephala, LeConte, McMurtr. Cuv. Anim. King., 1831, 1, p. 432.

fuliginosus, Cooper, Ann. Lyc. Nat. Hist. N. Y., 1837, Lv, p. 59, pl. iii, fig. 3.

carolinensis, Gundl. (nec Geoff.) Arch. f. Naturg., 1840, p. 358.

naso, Wagn. Supp. Schreib. Säug., 1844, p. 475.

mexicanus et azeticus, Sauss. Rev. Zool., 1860, pp. 283, 285.

Type locality. Brazil?

Geogr. Distr. Southern United States.

Genl. Char. Muzzle truncate with spines on upper border and an inner border of auricle; face with long bristles; tail free beyond toes.

Color. Upper parts and sides of neck plumbeous shading to dusky brown; sides and under parts paler; hairs of upper parts and sides of neck have their bases white, on other parts the hairs are unicolor.

Measurements. Head and body, 49; tail vertebræ, 15; tibia, 11; foot, 7; 2d metacarp, 38; ear, 13; tragus, 14; forearm, 40.

602. *femorosaccus*. (*Nyctinomus*), Merriam, N. Am. Faun., No. 2, 1889, p. 23.

Type locality. Agua Caliente, Colorado Desert, California.

Geogr. Distr. Only known from type locality.

Genl. Char. Incisors $\frac{1-1}{2-2}$. Lower incisors bifid and crowded; first upper premolar small; second very large and high antero-internal cusp. Ears thick, keel greatly developed with a large lobe on its lower third; antitragus higher than long, convex anteriorly, slightly concave posteriorly, and separated by a deep notch; tragus subquadrate. Tail more than half exerted. Gular sac present. The wing membrane is attached to the leg below the middle of the tibia, and the fur extends out, above and beneath, as far as a line

drawn from the middle of the humerus to the junction of the middle and outer thirds of the femur. (ex Merr., l. c.)

Color. Dull brown.

Measurements. (From the alcoholic specimen.) Total length, 103; head and body, 60; tail, 41; exserted part of tail, 2.3; head, 23; ear from crown, 14; ear from base of antitragus, 20; tragus, 1; humerus, 28; forearm, 47; third finger: metacarpal, 45; first phalanx, 20; second phalanx, 19; fifth finger, 44. (Merriam, l. c.)

603. mohavensis. (*Nyctinomus*), Merr., N. Am. Fauna, No. 2, 1889, p. 25.

Type locality. Fort Mojave, Arizona.

Genl. Char. Incisors $\frac{1-1}{2-2}$. Lower incisors not distinctly bifid; first upper premolar minute; second large with a well developed antero-internal cusp. Ear keel small, without a distinct lobe on its inner third; anterior convexity of auricle with six horny spines; antitragus very low and flat, much longer than high, not hiding tragus; tail less than half exserted, no gular sac.

Color. Above sooty; paler below.

Measurements. Total length, 94; tail, 34; exserted part of tail, 13.5; forearm, 44; humerus, 24; third metart, 43; tragus, 2; ear from base of antitragus, 18. (Merriam, l. c.)

Fam. II. **Phyllostomatidae.**

Cutaneous processes surrounding or close to the nasal apertures; ears moderately large, tragi well developed. Middle finger with three phalanges, index finger with one; premaxillæ united. Tail variable, either well developed or absent. Eyes large.

Sub. Fam. I. **Lobostominae.**

113. Mormops.

$$I. \frac{1-4}{4-4}; C. \frac{1-1}{1-1}; Pm. \frac{2-2}{3-3}; M. \frac{3-3}{3-3} = 42.$$

Mormops. Leach, Trans. Linn. Soc., 1820-22, xiii, p. 76.

Crown elevated high above line of face; nostrils destitute of cutaneous appendages and directed downward; ears close together, sometimes united by prolongations from the muzzle on their inner margins; cutaneous processes on chin and sides of lips.

604. megalophylla. Peters, M. B. Akad. Berl., 1864, p. 381; Mearns, Proc. Biol. Soc. Wash., 1900, p. 166.

Geogr. Distr. Antilles, Cuba, Jamaica, etc. One specimen taken at Fort Clark, Kinney County, Texas, Dec. 3, 1897. (vide Mearns, l. c.)



FIG. 92. MORMOPS BLAINVILLII.

No. 5202 Field Columbian Museum Coll.

Skull enlarged 3 times.

Incisors enlarged 9 times.

Genl. Char. Ear broad as high, tip rounded; extremity of muzzle truncated; lower jaw projecting slightly beyond upper. Wings from inferior surface of tibia; interfemoral membrane and calcaneum; interfemoral membrane extending beyond tail; tibia long.

Color. Dark reddish brown above and beneath.

Measurements. "Total length, 90; tail vertebræ, 28; alar-expanse, 373; longest finger, 90; head, 17; forearm, 56." (Mearns.)

Sub. Fam. II. Phyllostomatinae.

114. Otopterus.

I. $\frac{2-3}{2-2}$; C. $\frac{1-1}{1-1}$; P. $\frac{2-2}{3-3}$; M. $\frac{3-3}{3-3} = 34$.

Macrotus. Gray, Proc. Zool. Soc., 1843, p. 21. Type *M. waterhousii*. (nec Dej. Coleopt. 1833, *Macrotis*.)

Otopterus, Flow. & Lyddek Mamm. Liv. & Extinct, 1891, p. 673.

Ears large, united above and between eyes by membrane; tragus acute, elongated; nose leaf-shaped, like horseshoe in front, triangular behind; lower lip grooved, triangular wart in front; antebrachial membrane developed; tail elongate, tapering, projecting beyond margin of interfemoral membrane.



FIG 93. OTOPTERUS MEXICANUS.

No. 2404 Am. Mus. Nat. Hist. Coll.

Skull twice nat. size.

Incisors enlarged 6 times.

605. californicus. (*Macrotus*), Baird, Proc. Acad. Nat. Scien. Phil., 1858, p. 117.

Type locality. California.

Geogr. Distr. Limits of range not defined.

Genl. Char. Similar to *O. waterhousii*. Auricle longer than head; basal lobes developed; nose leaf with defined lower border; internal border of tragus thickened, and revoluted portion at base of

external border swollen; lower lip grooved, with a small wart on each side of the groove.

Color. Above and below gray; base of fur white; terminal third fawn.

Measurements. Total length, 66; tail vertebræ, 27; tibia, 20; foot, 10; forearm, 22; longest finger, 34; height of ear, 23; tragus, 10.

Fam. III. **Noctilionidae.**

Noctilionidae. Gray, Lond. Med. Repos., 1821, p. 299.

No distinct cutaneous foliaceous appendages surrounding the nostrils which open by a simple valvular aperture at the projecting extremity of the muzzle, which is truncated; ears large, often united; tragi short, expanded above; middle finger with two phlanges; tail partially free, extending beyond the posterior margin of interfemoral membrane, or perforating it and appearing on upper surface. Upper incisors large and separated from the canines. Molars with W-shaped cusps.

Sub. Fam. I. **Molossinae.**

Tail extending far behind interfemoral membrane; legs short, strong.

115. **Promops.**

$$I. \frac{1-1}{2-2}; C. \frac{1-1}{1-1}; P. \frac{2-2}{2-2}; M. \frac{3-3}{3-3} = 30.$$

Promops. Gerv. (nec Spix), Exp. du Comte de Castelnau, Zool. Mamm., 1855, p. 59, pl. xii, figs. 3, 3a. (teeth).

Ears close together or united at base of their inner margins; muzzle broad, obtuse or obliquely truncated; lips smooth; tragus short; first and fifth toes thickest, backs of all with long curved hairs. Upper incisors with their cusps close together in front.

606. californicus. Merr., N. Am. Faun., No. 4, 1890, p. 31.

Type locality. Alhambra, Los Angeles County, California.

Genl. Char. Similar to *M. glaucinus*. Ears very large, their bases united in front and projecting beyond muzzle, which is obliquely truncated. No wrinkles on lips, and a glandular swelling in front of each eye. Antitragus twice as long as high. Wings from juncture of middle and distal third of tibia. Posterior border of auricle emarginated; tubercle on interauricular membrane; first upper pre-molar central in space between canine and second premolar.

Geogr. Distr. Southern California. Exact range unknown.



FIG. 94. PROMOPS CALIFORNICUS.

No. 15751 Am. Mus. Nat. Hist. Coll.

Skull enlarged $\frac{1}{2}$.

Incisors enlarged 4 times.

Color. Sooty brown, palest beneath; bases of hairs everywhere pale drab gray.

Measurements Head and body, 102; tail vertebrae, 60; free part of tail, 13; height of ear, 24; length of ear, 39; tragus, 4; humerus, 41, forearm, 73; longest finger, 136; thumb, 9; tibia, 22.5; foot, 17.

APPENDIX.

THE FOLLOWING DESCRIPTIONS AND EMENDATIONS, SAVE SEVEN, WERE PUBLISHED AFTER THE PAGES IN THE BODY OF THE BOOK ON WHICH THEY WOULD PROPERLY FIND A PLACE HAD PASSED THROUGH THE PRESS; THE EXCEPTIONS WERE NOT KNOWN TO ME IN TIME TO BE INCLUDED IN THEIR PROPER POSITIONS.



Order I. **Marsupialia.**

Fam. I. **Didelphyidae.**

1. **Didelphys.**

1. **Didelphys virginiana.**

After the sheet containing this species had passed through the press, Dr. J. A. Allen published a paper in the Bulletin of the Am. Mus. Nat. History, October 12, 1900, entitled, a "Note on the Generic Names DIDELPHIS and PHILANDER," in which he endeavors to show by elimination, etc., that the proper name for the Virginia Opossum should be *marsupialis*, Linn., and not *virginiana*, Kerr. On this point also consult J. A. G. Rehn, American Naturalist, 1900, xxiv, pp. 575-578, and Alston, Biol. Centr. Amer., 1, p. 196 (foot note), where exactly the opposite decision has been reached.

Order V. **Ungulata.**

Fam. IV. **Bovidae.**

33. **Ovis.**

69. **Ovis fannini.** Hornaday, 5th Ann. Rep. N. Y. Zool. Soc., 1901, App. 1, p. 2.

Type locality. "Rocky Mountains," east side of the Yukon about seventy-five miles east of Dawson, Yukon, N. W. Ter.

Geogr. Distr. In the mountains above named, but the extent of its range unknown.

Genl. Char. Similar to *O. dalli*; shoulders, back, fore legs to knee and hind legs to hock outside, gray.

Color. General hue white, with the parts mentioned above gray, "giving the appearance of a white animal covered by a gray blanket." From knee to hoof of fore leg in front is a brown stripe, and a similar one extends on front of thigh also to the hoof. Tail similar to back, but darker. Rump patch white.

Measurements. Nose to tail, 1,525; height at shoulder, 865.

Horns. Similar to *O. dalli*. Circumference at base, 344; length on outer curve, 103; greatest spread (at rear), 546; distance between points, 509. (ex Hornaday, l. c.)

Order VI. **Rodentia.**Fam. I. **Sciuridae.****36. Sciurus.**

72. a. *Sciurus ludovicianus neglectus* (Gray), Nelson Proc. Biol. Soc. Wash., 1900, p. 170.

Macroxus neglectus, Gray, Am. Mag. Nat. Hist., 1867, 3d Ser. xx, p. 425.

Sciurus ludovicianus vicinus, Bangs, Proc. Biol. Soc. Wash., 1896, p. 150.

Type locality. Wilmington, Delaware (Thomas, vide Nelson l. c.)

Mr. Nelson in his article cited above has shown that Gray's name of *neglectus* was bestowed upon the eastern Fox Squirrel, afterwards called *vicinus* by Bangs, and the latter name will therefore become a synonym.

78. ii. *Sciurus hudsonius petulans*, Osgood, N. Am. Faun., 1900, p. 27.

Type locality. Glacier, White Pass, Alaska.

Geogr. Distr. Western Alaska, limits of range unknown.

Genl. Char. Similar to *S. h. vancouverensis*, but paler.

Color. Summer Pelage. Above raw umber and Prout's brown; top of head darker than back; legs and feet russet; under parts washed with rufous; tail, above hazel for three-fourths its length, margin and terminal portion black, edged with ochraceous; beneath paler.

Measurements. Total length, 299; tail vertebræ, 119; hind foot, 48. Ex. Spec., White Pass, Alaska.

37. Tamias.

95. cc. *Tamias (Eutamias) caniceps*. Osgood, N. Am. Faun., 1900, No. 19, p. 28.

Type locality. Lake Lebarge, Northwest Territory, Canada.

Geogr. Distr. Headwaters of the Yukon to Fort Selkirk, Long. 137° N. Lat. 62° W.

Genl. Char. Similar to *T. q. borealis*, but grayer; beneath white.

Color. Summer Pelage. Five black stripes on back; outer light stripes white, inner bluish white; dark facial stripes rufous black, light stripes nearly pure white. Sides bright ochraceous; arms gray.

Winter Pelage. Above olive gray, with black and white stripes; feet grayish white; tail, above black grizzled with white; beneath clay color margined with black and edged with white.

Measurements. Total length, 223; tail vertebræ, 103; hind foot, 32.

38. *Spermophilus.*

109. *b. Spermophilus empetra plesius*, Osgood, N. Am. Faun., 1900, No. 19, p. 29.

Type locality. Bennett City, Lake Bennett, British Columbia.

Geogr. Distr. South side of White Pass to Fort Selkirk, Alaska.

Genl. Char. Similar to *S. empetra*, but smaller; less fulvous; molar teeth larger.

Color. Postbreeding Pelage. Above mixed black, yellowish gray and white; top of head chestnut, nose and forehead hazel; sides of body, legs and under parts cinnamon rufous; chin white; tail, above black and yellowish, margined and broadly tipped with black and edged with white; beneath cinnamon rufous margined with yellowish white.

Spring Pelage. Above yellowish gray, nose, forehead and top of head cinnamon rufous; neck and shoulders hoary; sides and under parts grayish white washed with yellowish; feet buffy ochraceous; tail paler than in postbreeding pelage.

Measurements. Total length, 345; tail vertebræ, 93; hind foot, 50. (ex Osgood, l. c.)

40. *Arctomys.*

137. *a. Arctomys flaviventer avarus*. Bangs, Proc. N. Eng. Zool. Club, 1899, p. 68.

Type locality. Okanagan, British Columbia.

Geogr. Distr. British Columbia, range unknown.

Genl. Char. Similar to *A. flaviventer*, colors paler.

Color. Like *A. flaviventer*; "on the back and shoulders the black central bands of the hairs are much shorter and the yellowish and grayish tips much longer, giving to these parts a lighter and more hoary appearance; yellow of under parts, feet and hands paler."

Measurements. Type, youngish, total length, 457; tail vertebræ, 140; hind foot, 70. (Bangs, l. c.)

Sub. Fam. II. **Pteromyinae.****51. Sciuropterus.**

- 141. a. Sciuropterus yukonensis.** Osgood, N. Am. Faun., 1900, No. 19, p. 25.

Type locality. Camp Davidson, Yukon River, near Alaska-Canada boundary.

Geogr. Distr. Possibly from Chilkoot Inlet, Alaska, north to Canada boundary.

Genl. Char. Size large; tail long; color dark, base of face bluish black.

Color. Above pale cinnamon, beneath whitish suffused with cinnamon fawn; sides of head ashy and cinnamon; orbital ring black; tail, above fawn mixed with black. Feet, above dusky, beneath buffy white.

Measurements. Total length, 365; tail vertebræ, 180; hind foot, 41.

- 141. bb. Sciuropterus alpinus (volans) lascivus.** Bangs, Proc. N. Eng. Zool. Soc., 1899, p. 69.

Type locality. Tallac, El Dorado County, California.

Genl. Char. Similar to *S. v. californicus*, but darker; nasals longer, audital bullæ larger.

Color. Above cinnamon rust; beneath buffy white. Tail like back, darkest at tip. Cheeks smoke gray.

Measurements. "Total length, 300-320; tail vertebræ, 135-150; hind foot, 37-43; ear, 25.5-27." (Bangs, l. c.)

Fam. IV. **Muridae.**Sub. Fam. I. **Murinae.****44. Mus.**

- 149. Mus norwegicus.** Erxleb. Syst. Reg. Anim., 1777, p. 381.
Rehn, Proc. Biol. Soc. Wash., 1900, p. 167.

Mus decumanus, Pall. Glir., 1778, p. 91.

Mr. Rehn (l. c.) has shown that Erxleben gave the name of *norwegicus* to this rat one year before it was called *decumanus* by Pallas, and therefore the latter appellation will become a synonym.

Sub. Fam. II. **Cricetinae.****46. Peromyscus.**

- 192. bb. *Peromyscus (truei) scitulus.*** Bangs, Proc. N. Eng. Zool. Club, 1899, p. 67.

Type locality. Gardnerville, Douglas County, Nevada.

Genl. Char. Similar to *P. t. crinitus*, but paler, tail shorter.

Color. Above drab wood brown slightly lined with dusky; cheeks and lower sides washed with ochraceous buff; under parts white; anal region and sometimes a pectoral patch, buff; tail short, grayish above, white beneath.

Measurements. "Total length, 160-174; tail vertebræ, 80-92; hind foot, 20-22; ear, 18-21." (Bangs, l. c.)

Sub. Fam. III. **Neotominae.****50. Neotoma.**

- 225. a. *Neotoma bella.*** Bangs, Proc. N. Eng. Zool. Club, 1899, p. 66.

Type locality. Palm Springs, Riverside County, California.

Genl. Char. Color pale, tail well haired.

Color. Above pale buff-yellow lined with brownish-black; cheeks, sides and upper surfaces of legs and arms pale orange buff; beneath white; hairs on lower sides at base pale gray. Tail yellowish white above, white beneath. Feet and hands white. Ears large, nearly naked, pale grayish.

Measurements. Total length, 317; tail vertebræ, 155; hind foot (skin), 31.5. (ex Bangs, l. c.)

- 226. a. *Neotoma cinera lepida.*** Thom. A. M. N. H., 1893, p. 235.

Mr. Bangs, in a foot note on page 66, Proc. N. Eng. Zool. Club, 1899, states that Mr. Gerrit S. Miller, Jr., of the U. S. Nat. Museum, has examined the type of Mr. Thomas' species and is of the opinion that it is the same as *N. desertorum*, Merr. This being so, the name given by Dr. Merriam will become a synonym of *N. c. lepida*. Thos.

- 227. aa. *Neotoma saxamans.*** Osgood, N. Am. Faun., 1900, No. 19, p. 33.

Type locality. Bennett City, Lake Bennett, British Columbia.

Geogr. Distr. White Pass to the Semenow Hills, Alaska.

Genl. Char. "Rather larger than true *E. dorsatus*; tail averaging a little shorter; skull rather longer, rostral portions stouter; incisor teeth broader and stronger, and usually dull yellow; molari-form teeth smaller."

Color. "Hair jet black, or dull brownish or rusty black; a few of the stiff quill-like hairs on sides of tail and rump, tipped with yellowish; quills on head and fore part of body white basally and rusty brown at ends; quills on rump and tail white with brownish black ends."

Measurements. "Total length, 790; tail vertebræ, 166; hind foot, 124; ear, 36." (ex Bangs l. c.)

Order VII. **Carnivora.**

Fam. II. **Canidae.**

72. **Vulpes.**

459. *a.* ***Vulpes kenaiensis.*** Merr., Wash. Acad. Scien., 1900, p. 670.

Type locality. Kenai Peninsula, Alaska.

Geogr. Distr. Kenai Peninsula.

Genl. Char. Skull only known. "Similar in general to *V. harri-mani*, but rostrum decidedly longer, less swollen over canines, lateral constriction absent, and nose less upturned; zygomata more spreading posteriorly; frontal broader interorbitally; premolars more spaced; upper carnassial and first upper molar huge; upper carnassial with antero-internal cusp weaker and set more anteriorly (not projecting so far into palate); first upper molar larger; second lower molar larger and more bellied on inner side; last lower molar often absent."

Measurements. Basal length, 148; basilar length, 145; palatal length, 79; postpalatal length, 68; zygomatic breadth, 82.5; interorbital breadth, 30.5; least breadth of rostrum on plane of second molar (constriction absent), 27; length of crown of pm⁴ on outer side, 15.5; length of m¹ on outer side, 11; length of heel (transversely) from notch on outer side, 13." (Merriam l. c.)

459. *aa.* ***Vulpes regalis.*** Merr., Wash. Acad. Scien., 1900, p. 672.

Type locality. Elk River, Sherburn County, Minnesota.

Geogr. Distr. Northern Plains from Dakota to Alberta; east to Manitoba and Minnesota; limits unknown.

Genl. Char. Size large; ears large and broad, tail long. Sexes differing in size.

Color. Face, top of head and base of ears straw yellow; upper parts golden yellow, or pale yellowish fulvous, buffy white posteriorly and grizzled on hind back; fore and hind legs red; black on fore feet reaching half way between wrist and elbow; black on hind feet ending at ankle. Tail like back at base, rest buffy, tip white, black hairs intermixed.

Measurements. "Type. Total length in flesh, 1,117; tail vertebræ (skin), 420; hind foot (skin), 170; ear from anterior base (skin), 98." (Merriam l. c.)

460. *aa. Vulpes necator.* Merr., Wash. Acad. Scien., 1900, p. 664.

Type locality. Whitney Meadows near Mt. Whitney, California.

Geogr. Distr. Southern or High Sierra, California.

Genl. Char. Like *V. pennsylvanica*, but nose darker; black on legs restricted; back redder and duller; ground color of tail buffy. Skull: rostrum more slender; molars larger and heavier.

Color. Face dull fulvous grizzled with whitish; sides of nose dusky grizzled with buffy; upper parts rusty fulvous, sides paler; black on fore feet reaching to elbow; black on hind feet to tarsal joint; tail fulvous at base, then buffy whitish mixed with black hairs; black spot at base, tip white.

Measurements. Type. Total length, 930; tail vertebræ, 345; hind foot, 150. (ex Merriam l. c.)

460. *aaa. Vulpes cascadenis.* Merr., Wash. Acad. Scien., 1900, p. 665.

Type locality. Trout Lake, base of Mt. Adams, Cascade Range, Washington.

Geogr. Distr. Cascade Range in Oregon and Washington and northern Sierra Nevada in California.

Genl. Char. Size small, tail short. What should be the red pelage is yellow.

Color. General color of head and upper parts straw yellow, nose to eyes yellowish fulvous, top of head and base of ears pale straw yellow; back golden yellowish fulvous; tail pale; black on ears and feet restricted and mixed with pale fulvous on latter.

Black-Cross Phase. "Top of nose grizzled brownish; sides of nose and imperfect ring around eye dusky or blackish grizzled with whitish; top of head yellowish white, the black under fur showing through; dorsal cross (back and shoulders) blackish, overlaid and nearly concealed by yellowish white or buffy; sides of neck, flanks and post-scapular region golden yellow; distal two-thirds of ear black; fore feet black, grizzled above elbow with whitish and yellowish; hind feet and legs grizzled dusky and buffy, becoming nearly

black on top of feet; chin, throat and band down middle of belly black or blackish; inner sides of thighs washed with dusky. Tail black mixed with buffy and tipped with white."

Measurements. "Average of three males from Mt. Adams, Washington: total length, 1,070; tail vertebræ; 412; hind foot, 178." (ex Merriam l. c.)

460. cc. *Vulpes pennsylvanica bangsi.* (Merr.) Wash. Acad. Scien., 1900, p. 667.

Type locality. Lance au Loup, Labrador.

Geogr. Distr. Labrador.

Genl. Char. Similar to *V. pennsylvanica*, but *ears smaller, black of ears and feet more restricted.*

Color. Above as in *V. pennsylvanica*, differences from that species italicised above.

Measurements. Immature. Total length, 964; tail vertebræ, 378; hind foot, 168; ear from notch, 88. (ex Merriam l. c.)

460. ccc. *Vulpes alascensis.* Merr., Wash. Acad. Scien., 1900, p. 668.

Type locality. Andreafski, Alaska.

Geogr. Distr. Northern Alaska.

Genl. Char. Similar to *rubricosa* and *bangsi*; tail long, ears small.

Color. Upper parts similar to *V. pennsylvanica*, but deeper on neck and dorsal line; rump and hind back grizzled; black of feet restricted. Tail long, bushy fulvous mixed with black. (ex Merriam l. c.)

Vulpes alascensis abietorum. Merr., Wash. Acad. Scien., 1900, p. 669.

Type locality. Stuart Lake, British Columbia.

Geogr. Distr. Interior of British Columbia and probably southeastern Alaska.

Genl. Char. Skull alone known. Like *alascensis*, but "*lighter, longer and more slender.*" (Merr.)

507. aa. *Putorius muricus.* Bangs, Proc. N. Eng. Zool. Club, 1899, p. 71.

Type locality. Echo, El Dorado County, California.

Genl. Char. Size very small. Tail short, tip black.

Color. Upper parts and tail, except black tip, drab brown tinged with reddish or chocolate; under parts, hands, toes and upper lip white. Skull has largely inflated squamosals.

Measurements. Total length, 220; tail vertebræ, 60; hind foot, 31. (ex Bangs, l. c.)

Order IX. **Insectivora.**Fam. II. **Talpidae.**Sub. Fam. II. **Talpinae.****99. Scapanus.**

578. a. *Scapanus californicus minusculus.* Bangs, Proc. N. Eng.

Zool. Soc., 1899, p. 70.

Type locality, Fyffe, El Dorado County, California.

Genl. Char. Smaller than *S. californicus*, color paler.

Color. Above lustrous drab gray, beneath shining cinereous.

Measurements. Total length, 160; tail vertebræ, 31; hind foot, 21;
(Bangs, l. c.)

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ZOOLOGICAL SERIES.

VOL. II, No. 2.

A LIST
OF THE
LAND AND SEA MAMMALS
OF
NORTH AMERICA
NORTH OF MEXICO.

SUPPLEMENT TO THE SYNOPSIS.

BY

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Curator of Department.



CHICAGO, U. S. A.

June, 1901.

PREFACE.

The present List contains all the named forms of North American mammals on land or in the adjacent seas described up to this date, that, under the most lenient treatment, are entitled to any consideration. The various forms that were included in the Appendix to the "Synopsis of North American Mammals" have been placed in their proper positions.

Five species that were omitted from that work, and such forms as have been named since it passed through the press, have been added with their descriptions, and will be found under their respective genera.

A few changes in genera and species, affected by the rule of priority, have been made, and typographical errors in names, which, in spite of every care have appeared in the "Synopsis," have been corrected, and the spelling in this List should be adopted whenever differing from that in the book just mentioned. This publication, therefore, may serve as a Check List of our Mammals, as a guide for labeling specimens, and as a Supplement to the "Synopsis," to be bound with it, and bringing it to date.

The pagination given is that of the "Synopsis."

Especial thanks are due to Dr. F. W. True of the U. S. Nat. Museum, Washington, for photographs of the skulls of *Kogia breviceps* and *Berardius bairdi* in the National collection, from which the plates accompanying this publication were taken.

D. G. E.

June 10, 1901.

CLASS MAMMALIA.

Order I. **Marsupialia.**

Fam. I. **Didelphyidae.**

1. **Didelphys.** Linn., 1758.

	PAGE
1. * Didelphys virginiana. Kerr.	I
<i>Didelphys virginiana pigra.</i> Bangs.	I
2. Didelphys californica. Bennett.	3

Order II. **Edentata.**

Fam. I. **Dasypodidae.**

2. †**Tatu.** Blumenbach, 1799.

3. **Tatu novemcinctus.** (Linn.).....

Order III. **Sirenia.**

Fam. I. **Hydrodamalidae.**

3. **Hydrodamalis.** Retzius, 1794.

4. **Hydrodamalis gigas.** (Zimm.).... 5

Fam. II. **Manatidae.**

4. **Manatus.** Storr, 1780.

5. **Manatus latirostris.** Harl. 6

* Regarding the adoption of this specific name, see Thomas, Amer. Nat., 1901, p. 144.

† See Palmer, Proc. Biol. Soc. Wash., 1897, p. 174.

Mr. Witmer Stone has called my attention to the fact that this generic term was published by Blumenbach in the Handbuch der Naturgeschichte, Göttingen, in 1799, p. 73, four years previous to the edition quoted by Dr. Palmer, thus taking precedence by many years over any generic term proposed for the nine-banded Armadillo. *Novemcinctus* is the only species included in **Tatu**, and therefore represents the genus.

Order IV. **Cetacea.**Fam. I. **Balaenidae.**5. **Balaena.** Linn., 1766.

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6. Balaena glacialis. Bonnat.	8
7. Balaena sieboldi. (Gray.).....	8
8. Balaena mysticetus. Linn.	8
9. Balaena kuzira. (Gray.)	9

6. ***Rhachianectes.** Cope, 1869.

10. Rhachianectes glaucus. (Cope.)	9
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7. **Megaptera.** Gray, 1864.

11. Megaptera nodosa. (Bonn.)	10
<i>Megaptera nodosa osphyia.</i> (Cope.).....	10
12. Megaptera versabilis. (Cope.).....	10

8. **Agaphelus.** Cope, 1868.

13. Agaphelus gibbosus. (Erxleb.)	11
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9. **Balaenoptera.** Lacép., 1804.

14. Balaenoptera acuto-rostrata. Lacép.	11
15. Balaenoptera davidsoni. Scamm.	12
16. Balaenoptera velifera. Cope.	12
<i>Balaenoptera velifera copei.</i> Elliot.	13
17. Balaenoptera physalus. (Linn.)	13
18. Balaenoptera borealis. Less.	13
19. Balaenoptera musculus. (Linn.).....	13
20. Balaenoptera sulfurea. (Cope.).....	14

Fam. II. **Physeteridae.**10. **Physeter.** Linn., 1766.

21. Physeter macrocephalus. Linn.	15
---	----

11. **Hyperoödon.** Lacép., 1804.

22. Hyperoödon rostratus. (Müll.).....	16
---	----

**ῥάχις* = *Rhachianectes*, nec *Rachianectes*.



KOGIA BREVICEPS.

Superior surface

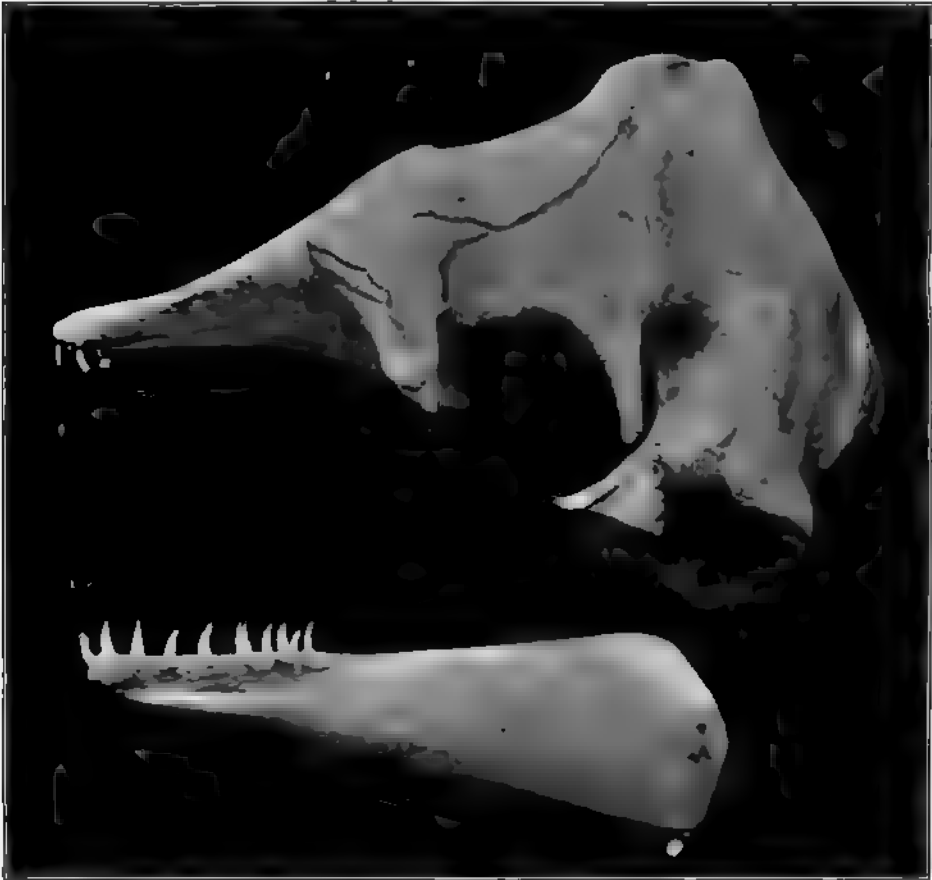
No. 2162ⁿ U. S. Nat. Mus. About $\frac{1}{3}$ nat. size.



KOGIA BREVICEPS.

Inferior surface

No. 21627 U. S. Nat. Mus. About $\frac{1}{2}$ nat. size.



KOGIA BREVICEPS.

No. 21627 U S Nat. Mus. About $\frac{1}{2}$ nat. size

12. **Kogia*.

$$\frac{0-0}{9-9} \text{ to } \frac{0-0}{12-12} = 18 \text{ to } 24.$$

Kogia. Gray, Voy. Erebus and Terror. Zoöl., 1846, p. 22.

“Teeth of the upper jaw absent, or reduced to a rudimentary pair in front; in the lower jaw 9 to 12 on each side, rather long, slender, pointed and curved, with a coating of enamel. Upper surface of cranium concave, with thick, raised posterior and lateral margins, massive and rounded at their anterior terminations above the orbits. Upper edge of the methesmoid forming a prominent sinuous ridge, constituting a kind of longitudinal septum to the base of the great supra-cranial cavity. Rostrum not longer than the cranial portion of the skull, broad at the base, and rapidly tapering to the apex. Vertebrae: C. 7, D. 13 or 14, L. and C. 30; total, 50 or 51. All the cervical vertebrae united by their bodies and arches.” (Flower.)

23. breviceps. (*Physeter*), Blainv., Ann. Anat. and Phys., 11, 1838, p. 337.

?*floweri*, Gill, Amer. Nat., iv, 1871, p. 738, fig. 172.

Type locality. Cape of Good Hope.

Geogr. Distr. Indian and Pacific Oceans, coast of southern California and Atlantic coast of North America.

Genl. Char. Blainville's description of a skull of this species in the Paris Museum, from an individual taken at the Cape of Good Hope, translated is as follows: “Skull extremely wide and greatly elevated, having the frontal crests very high and consequently the nasal cavities very deep, something like those of the Cachelots, and terminate abruptly by the very short and pointed maxillaries, therefore the total length is barely an inch greater than the occipital length. The lower jaw has necessarily two branches approaching each other evenly, like a bellows, and have a considerable symphysis, with a narrow extremity, but rounded termination. It is nearly certain that there are no teeth in the upper jaw, but the lower has 14 or 15 on each side, all of which are not in place, 5 only on the left side and 4 on the right remain still in their alveoli; some have been replaced by others; they are narrow, slender, conical, pointed, slightly curved interiorly, and 6 to 8 lines in length. Length of lower jaw, 13 inches; distance between condyles, 12 inches. Length of skull, 14½ inches. Another peculiarity of the skull is the inequality of the nasal cavities, the right being in nearly a rudimentary condition, and some twenty times smaller than the other.”

* Omitted in the Synopsis.

Color. Black.
Measurements. Total length, 20 feet.

13. *Ziphius*. Cuv., 1823.

	PAGE.
24. <i>Ziphius cavirostris</i> . Cuv.	17
25. * <i>grebnitzkii</i> . (<i>Ziphius</i>), Stejneger, Proc. U. S. Nat. Mus., 1883, P. 77.	

Type locality. Bering Island.

Genl. Char. "The tip of the beak is obtuse, with a vertical furrow in the middle, the lower jaw with the two terminal teeth protruding considerably beyond the upper one. From about the middle of the beak towards the tip, the mesethmoidal, ossified in its whole length, arises, like a rounded staff, between and above the premaxillaries, following these to the tip and being totally fused together with them. The nasal groove is very unsymmetrical, owing to a very prominent asymmetry of the premaxillaries and the nasals, so that the direction of the oblique nares forms an angle of not less than 20 degrees with the vertical plane through the longitudinal axis of the skull. The right os nasale and the premaxilla of the same side are by far the larger ones, and form the principal part of the roof above the nares, the nasal not reaching, however, so far forward as the premaxilla. The ante-nasal groove is large, and in the anterior half partly vaulted over by the edges of the premaxillaries, which are somewhat bent inwards. The zygomatic process of the squamosals touches the orbital of the frontals without coalescing however. The jugale is not narrower in the fore part, which, consequently, is not dilated and does not reach the posterior maxillary notch. This is not particularly deep, and the anterior one is still more shallow. The visible part of the vomer is long and narrow, commencing 124 mm. from the tip of the beak. The supraoccipital is rather inclined forwards, forming an angle of about 40 degrees, with a line parallel to the vertical axis of the skull."

Measurements. "Length of the skull in straight line, 983; greatest breadth, 600; length of beak from anterior maxillary notch to tip, 485; length of right nasal, 135; of left nasal, 128; length of lower jaw, 845; length of symphysis, 180; longitudinal diameter of tooth at base, 26; height of tooth, 36." (Stejneger, l. c.)

14. *Mesoplodon*. Gerv., 1850.

26. <i>Mesoplodon bidens</i> . (Sowerby.)	18
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* Omitted in the Synopsis.

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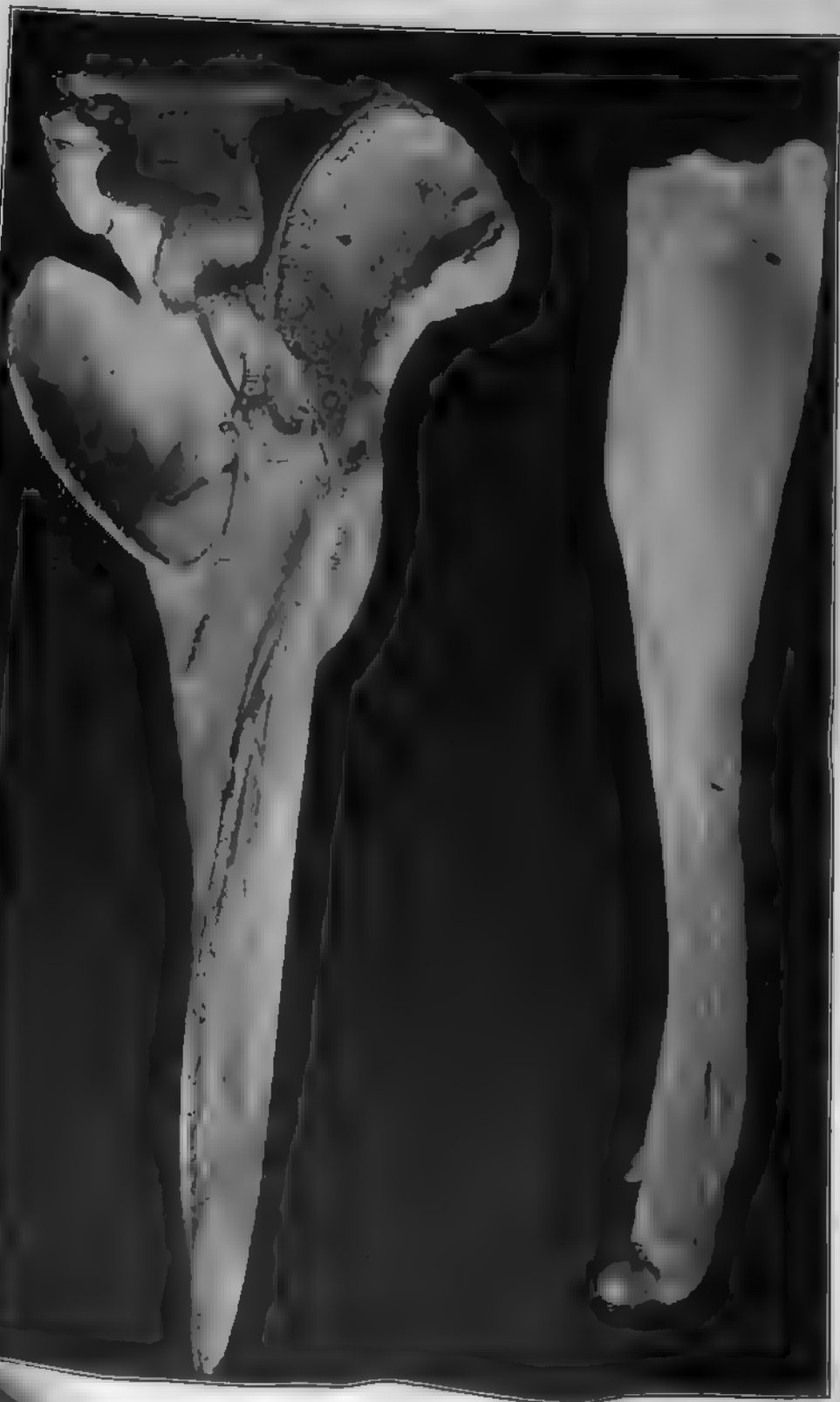
BERARDIUS BAIRDI.

Superior surface of skull $\frac{1}{2}$ nat. size. No. 8092. U. S. Nat. Mus. Type specimen.

FIELD COLUMBIAN MUSEUM.



BERARDIUS BAIRDII.
Inferior surface of skull $\frac{1}{4}$ nat. size. No. 2092, U. S. Nat. Mus. Type specimen.



	PAGE.
27. * <i>Mesoplodon stejnegeri</i> . True.	14

15. †*Berardius*.

$$\frac{0-0}{2-2} = 4.$$

Berardius. Duvernoy, Ann. Scien. Nat. Zoöl., xv, 1851, p. 41.

Frontal portion of skull elevated; rostrum, subcylindrical, slender, long and narrow; maxillaries slightly swollen and expanded at upper ends; two teeth on each side of the symphysis of lower jaw, the anterior the larger and near the end compressed, triangular, similar but smaller than those of *Ziphius*. Nasals broad, flattened in front. Mesethmoid partly ossified.

28. ‡*bairdi*. (*Berardius*), Stejneger, Proc. U. S. Nat. Mus., 1883, p. 75.

Type locality. Stare Gavan, Bering Island.

Genl. Char. Skull only preserved. "Very low and scarcely incurved maxillary crests; the shortest distance of which is $2\frac{2}{3}$ times greater than their greatest height. * * * The groove between the maxillary and the nuchal crest is very shallow. The maxillary notch is deep. The beak is long, making only little less than half the length of the entire skull. Nares straight; right nasal larger than the left one, but not very much. The occipital condyles do not come in contact beneath the foramen magnum; the symphysis of the lower jaw is very short, amounting to only one-fifth of the whole length of the jaw. Teeth are situated on the tip of the lower jaw."

Measurements. "Length of skull, 1405; greatest breadth, 698; length from process of supramaxillaries before orbit to posterior edge of condyles, 610; from same process to tip of beak, 890; greatest height of maxillary crests, 86; length of lower jaw, 1292; length of symphysis, 257. Total length of animal about 18 feet." (Stejneger, l. c.)

Fam. III. **Delphinidae.**

16. **Monodon.** Linn., 1766.

29. <i>Monodon monoceros</i> . Linn.	19
---	----

17. **Delphinapterus.** Lacép., 1804.

30. <i>Delphinapterus leucas</i> . (Pall.).....	19
---	----

* Misplaced on page 14 of the Synopsis. Should go after *M. bidens*, p. 18.
† Omitted in the Synopsis.
‡ Probably merely a straggler on our Pacific coast.

18. Phocaena. Cuv., 1817.

	PAGE.
31. * <i>Phocaena phocaena</i> . (Linn.).....	20
32. <i>Phocaena dalli</i> . True.	21

19. Orcinus. Fitzin., 1860.

33. <i>Orcinus gladiator</i> . (Bonnat.).....	22
34. <i>Orcinus rectipinnus</i> . (Cope.).....	22

20. Pseudorca. Reinh., 1862.

35. <i>Pseudorca crassidens</i> . (Owen.).....	23
--	----

21. Globiocephalus. Less., 1842.

36. <i>Globiocephalus melas</i> . (Traill.).....	23
37. <i>Globiocephalus brachypterus</i> . Cope.	24
38. <i>Globiocephalus scammoni</i> . Cope.	24

22. Grampus. Gray, 1846.

39. <i>Grampus griseus</i> . (Cuv.).....	25
--	----

23. Lagenorhynchus. Gray, 1846.

40. <i>Lagenorhynchus acutus</i> . (Gray.).....	25
41. <i>Lagenorhynchus thicola</i> . Gray.	26
42. <i>Lagenorhynchus albirostris</i> . (Gray.).....	26
43. <i>Lagenorhynchus obliquidens</i> . Gill.	27

24. Delphinus. Linn., 1758.

44. <i>Delphinus delphis</i> . Linn.	28
---	----

25. Tursiops. Gerv., 1855.

45. <i>Tursiops tursio</i> . (Fabric.).....	29
46. <i>Tursiops gilli</i> . Dall.	29

26. Lissodelphis. Glog., 1841.

47. <i>Lissodelphis borealis</i> . (Peale.).....	30
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27. Prodelphinus. Gerv., 1880.

48. <i>Prodelphinus euphrosine</i> . (Gray.).....	30
49. <i>Prodelphinus crotaphiscus</i> . (Cope.).....	31
50. <i>Prodelphinus plagiodon</i> . (Cope.).....	31
51. <i>Prodelphinus frenatus</i> . (Cuv.).....	32

* By an oversight called in the Synopsis *communis*.

Order V. **Ungulata.**

Fam. I. **Tayassuidae.**

28. ***Tayassu.** Fisch., 1814.

	PAGE.
52. Tayassu tajacu. (Linn.).....	33

Fam. II. **Cervidae.**

Sub. Fam. I. **Cervinae.**

29. **Cervus.** Linn., 1758.

53. Cervus canadensis. Erxl., 1777.	34
<i>Cervus canadensis occidentalis.</i> H. Smith.	34

30. **Rangifer.** H. Smith, 1827.

54. Rangifer caribou. (Gmel.).....	35
55. Rangifer terraenovae. Bangs.	36
56. Rangifer montanus. E. S. Thompson.	36
57. † Rangifer stonei. Allen, Bull. Amer. Mus. Nat. Hist., N. Y., 1901, p. 143.	

Type locality. Kenai Peninsula, Alaska.

Genl. Char. Skull narrow, slender; antlers slender, palmation narrow; brow and beztines well developed. Fringe of white hairs on front of neck. Head and horns alone preserved.

Color. Nose and middle of nostrils, chin and edges of lower lip grayish white; top of nose to eyes black; sides of head dark brown; space around eyes grayish; top and sides of neck grayish brown, lighter at base of neck; front of neck white, with a white fringe 100 to 130 mm. wide and 200 to 225 mm. long.

Measurements. Total length, 2159; tail, 152; tarsus, 584; height at elbow, 711; at brisket, 712; at withers, 1321. Taken from the animal in the flesh. (Ex. Allen, l. c.)

58. Rangifer dawsoni. E. S. Thompson.	36
59. Rangifer groenlandicus. (Gmel.).....	37
60. Rangifer arcticus. (Rich.).....	37

31. **Alces.** H. Smith, 1827.

61. Alces americanus. Jard.	38
62. Alces gigas. Miller.	38

* Fisch. Zoognosia, iii, 1814, pp. 284-289, antedates Dicotyles, Cuv., 1817.
† Published after the Synopsis was issued.

32. Odocoileus. Rafin., 1832.

	PAGE.
63. <i>Odocoileus americanus</i> . (Erxleb.).....	39
<i>Odocoileus americanus macrourus</i> . (Rafin.).....	39
<i>Odocoileus americanus texensis</i> . (Mearns.).....	40
<i>Odocoileus americanus osceola</i> . (Bangs.).....	40
<i>Odocoileus americanus couesi</i> . (Coues & Yarrow.).....	40
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<i>Ovis cervina auduboni</i> . Merr., Proc. Biol. Soc. Wash., 1901, p. 31.	

Type locality. "Upper Missouri." Bad Lands of South Dakota?

* As there is no positive date known for Shaw's plate (610) of the Mountain Sheep, that of 1802 being established purely upon the supposed hypothesis that the work appeared at uniformly regular intervals throughout the twenty-four years of its publication (and of which there is no proof whatever), there should be no hesitation in accepting Desmarest's name *O. cervina* for the species, bestowed without question in 1804, of which Shaw's name *O. canadensis* would be a synonym. A date that is well established should always have precedence over one founded merely upon a supposition.

Published after the Synopsis was issued.

Genl. Char. “Size large; skull and horns broad and massive; molar teeth much larger than in any known American sheep, the upper tooth row in adult males measuring 96 mm. or more, and the three upper molars 63–65 mm. Under jaw (in type specimen) massive, heavy posteriorly, deeply bellied (depth under last molar 52 mm.); angle broadly rounded. In *canadensis* (*cervina*), the jaw is light throughout and the angle, while small, is marked. Horns narrower, and as a rule larger than in *canadensis* (*cervina*).”* (Merr., l. c.) No skins examined.

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36. *Ovibos*. De Blainv., 1816.

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†*Ovibos moschatus wardi*. Lydekker, Nature, lxiii, Dec., 1900, p. 157.

Type locality. East Greenland.

Geogr. Distr. “Southern border of Ellesmere Land northward through Grinnell Land to the Polar Sea, and on the Greenland coast from about latitude 78° on the western side northward to and around the northern end of Greenland to about latitude 75° N. on the east coast.” (Allen.)

Genl. Char. Basal portion of horns narrow. White on face and top of head, and lighter legs.

Color. Similar to *O. moschatus*, but with a white area on the front of the head forming a face spot; ear and patch below the ears gray; between the ears on top of head whitish; saddle mark of light brown; rest of body dark brown.

(Adult bulls have the head and neck almost jet black; visible portion of legs whitish, but sometimes marked with dark brown. The white on head seems very variable, for out of seven specimens supposed to be of this variety in the Field Columbian Museum, none have any white on the *face* except the old cow. The old bull has no white at all upon the head, and the next bull, one in his prime, has a jet black head and neck, with but a little white about the horn bases;

* Relative sizes of molar teeth and parts of crania are properly classed in the majority of cases, with those differences resulting simply from individual variation, and it would seem unlikely that the Dakotas and Montana, contiguous States, would each contain a distinct variety of mountain sheep. The greater depth and massiveness of lower jaw is apparently restricted to the *type specimen*.

† Published after the Synopsis was issued.

the two-year-old animals and two calves have white between the horns, but none on the face. These were stated to have been all members of one herd and killed in the Hudson Bay region.)

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* Called *Bison americanus* in the Synopsis. **Bos bison**, Linn. Syst. Nat., 1, 1766, p. 99, antedates *americanus*, Gmel.

† *Sciurus griseus anthonyi*, 74, b, p. 57 of the Synopsis, is not separable from **S. griseus**, and therefore becomes a synonym. (Vide Nelson, Proc. Acad. Scien. Wash., 1, 1900, p. 83.)

‡ Preoccupied. Vide True, Proc. Biol. Soc. Wash., xiii, 1900, p. 183.

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* The name *americanus*, Kerr, retained in the Synopsis, having been bestowed by that author on an undeterminable species four pages earlier in his work, cannot be again employed, although his *Mus agrarius americanus* is undoubtedly the same as *P. leucopus*, Rafin. (See Allen, Bull. Am. Mus. Nat. Hist., N. Y., 1895, p. 108. Foot-note.) *P. leucopus* will therefore be the proper appellation for the white-footed mouse, nec *americanus*, Kerr.

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* *μακροτης* — *λάγως*.

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* No. 448 a. *Felis rufa maculata*, Vig. & Horsf., of the Synopsis, should be changed to *texensis*, Allen, and stand as follows:

Felis rufa texensis (Allen), Bull. Am. Mus. Nat. Hist. 1895, p. 188.

maculata, Vig. & Horsf., Zool. Journ., 18, 1829, p. 381, pl. 13. (nec Kerr.)

rufus, var *maculatus*, Aud. & Bach., N. Am. Quad., 11, 1851, p. 293.

And 448 h. *Felis rufa texensis* (Allen), should be omitted. Kerr's species, *Felis vulgaris maculatus* not being determinable.

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74. *Vulpes*. Briss., 1758.

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75. *Urocyon*. Baird, 1857.

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<i>Urocyon cinereo-argenteus texensis</i> . Mearns.	308
<i>Urocyon cinereo-argenteus californicus</i> . Mearns.	308
<i>Urocyon cinereo-argenteus townsendi</i> . Merr.	309
<i>Urocyon cinereo-argenteus ocythous</i> . Bangs.	309

*Urocyon cinereo-argenteus *littoralis*. Baird, N. Am. Mamm.,
1857, p. 143.

Type locality. San Miguel Island, coast of California.

Geogr. Distr. Known only from type locality.

*Omitted in the Synopsis.

Genl. Char. Size very small, half that of *U. cinereo-argenteus*. Tail one-third as long as body without head.

Color. Diminutive miniature of the gray fox. Upper parts mixed grayish white and black; under parts brownish white; base of ears, sides of neck, lower portions of sides of the body and fore legs, cinnamon; chin and sides of muzzle black; lower part of face and throat white; tail with a black stripe above, sides grayish; beneath rusty.

Measurements. Total length, 622; tail vertebræ, 152; hind foot, 89.

Fam. III. **Ursidae.**

Sub. Fam. I. **Ursinae.**

76. Ursus. Linn., 1758.

A. *Thalassarctus.*

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486. <i>Ursus maritimus.</i> Desm.	310

B. *Ursus.*

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488. <i>Ursus dalli.</i> Merr.	311

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489. <i>Ursus horribilis.</i> Ord.	312
<i>Ursus horribilis alascensis.</i> Merr.	312
<i>Ursus horribilis horriaeus.</i> Baird.	312
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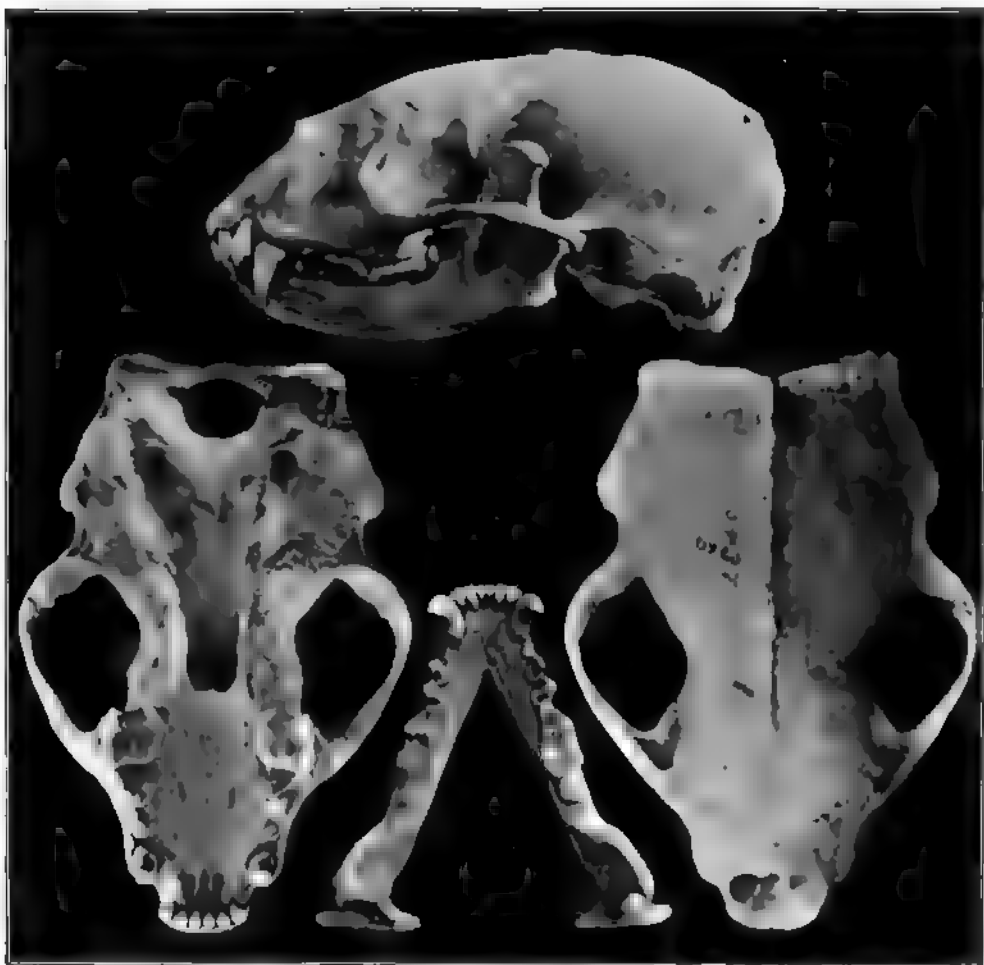
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Sub. Fam. I. **Procyoninae.**

77. Bassariscus. Coues, 1887.

495. <i>Bassariscus astutus.</i> Licht.	316
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<i>Bassariscus astutus flavus.</i> Rhoads.	316
<i>Bassariscus astutus oregonus.</i> Rhoads.	317



CONEPATUS MAPURITO.
No. 5457 Field Columbian Museum Coll. Nat. size.

78. **Procyon.** Storr, 1780.

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<i>Procyon lotor pallidus.</i> Merr.	318
<i>Procyon lotor pacificus.</i> Merr.	319
<i>Procyon lotor elucus.</i> Bangs.	319

Fam. V. **Mustelidae.**

Sub. Fam. I. **Melinae.**

79. **Taxidea.** Waterh., 1838.

497. Taxidea americana. (Bodd.)	320
<i>Taxidea americana neglecta.</i> Mearns.	321
<i>Taxidea americana berlandieri.</i> Baird.	321

80. **Mephitis.** Cuv., 1800.

498. Mephitis mephitis. (Shaw.)	322
<i>Mephitis mephitis hudsonia.</i> Rich.	322
<i>Mephitis mephitis scrutator.</i> Bangs.	324
499. Mephitis elongata. Bangs.	324
500. Mephitis occidentalis. Baird.	324
501. Mephitis milleri. Mearns.	325
502. Mephitis mesomelas. Licht.	325
503. Mephitis estor. Merr.	326
504. Mephitis spissigrada. Bangs.	326
505. Mephitis faetulenta. Elliot.	326
506. Mephitis avia. Bangs.	327

81. ***Conepatus.**

$$I. \frac{3-3}{3-3}; C. \frac{1-1}{1-1}; P. \frac{2-2}{3-3}; M. \frac{1-1}{2-2} = 32.$$

Conepatus. Gray, Ann. Mag. Nat. Hist., Ser. 2nd; 1, 1837, p. 581.

Body stouter than *Mephitis*; nostrils opening downward and forward, not laterally. First premolar absent. Pterygoid fossæ short and rather narrow; palate extending beyond posterior border of molar. Postorbital processes generally absent. Superior outline of skull a gradual curve from occiput to end of premaxillaries. Fore claws large and strong.

* Omitted in Synopsis.

507. *mapurito. (*Viverra*), Gmel. Syst. Nat., 1, 1788, p. 88.

Type locality. Unknown.

Geogr. Distr. Texas to Arizona, Mexico, Central America, and South America to Patagonia.

Color. Entire upper parts from crown of head to end of tail white, or yellowish white; sides and legs shining black; under parts dull black except a narrow line between jaws and throat which are white. Tail white above and below. Claws white.

Measurements. Total length (dried skin), 790; tail to end of hair, 370.

82. *Spilogale*. Gray, 1865.

	PAGE.
508. <i>Spilogale putorius</i>. (Linn.)	327
509. <i>Spilogale interrupta</i>. (Rafin.)	328
510. <i>Spilogale ringens</i>. Merr.	329
511. <i>Spilogale indianola</i>. Merr.	329
512. <i>Spilogale leucoparia</i>. Merr.	329
513. <i>Spilogale gracilis</i>. Merr.	330
514. <i>Spilogale saxatilis</i>. Merr.	330
515. <i>Spilogale phenax</i>. Merr.	331
<i>Spilogale phenax latifrons</i> . Merr.	331
<i>Spilogale phenax arizonae</i> . Mearns.	331
516. <i>Spilogale olympica</i>. Elliot.	332
517. <i>Spilogale ambarvalis</i>. Bangs.	332

Sub. Fam. II. *Mustelinae*.

83. *Gulo*. Storr, 1780.

518. <i>Gulo luscus</i>. (Linn.)	333
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84. *Mustela*. Linn., 1766.

519. <i>Mustela americana</i>. Turton.	334
520. <i>Mustela</i> †<i>caurina</i>. Merr.	335
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<i>Mustela caurina brumalis</i> . Bangs.	336
<i>Mustela caurina actiuosa</i> . Osgood.	336
521. <i>Mustela pennanti</i>. Erxleb.	337
<i>Mustela pennanti pacifica</i> . Rhoads.	337

* This tropical species is occasionally met with in certain portions of United States territory bordering on Mexico. The specimen here described was captured in Pinal County, Arizona.

+ *caurina* has priority over *atrata* and should be the species, reversing the order in the Synopsis.

85. **Putorius.** Cuv., 1817.

*Bangs, O., *A Review of the Weasels of Eastern North America*, *Proc. Biol. Soc. Wash.*, Feb., 1896, pp. 11-24.

Merriam, C. H., *Synopsis of the Weasels of North America*, *N. Am. Fauna*, No. 11, June, 1896, pp. 5-36.

A. **Lutreola.**

	PAGE.
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<i>Putorius vison lutrecephalus.</i> Harlan.	339
<i>Putorius vison vulgivagus.</i> Bangs.	340
<i>Putorius vison energumenus.</i> Bangs.	340
<i>Putorius vison ingens.</i> Osgood.	340
523. Putorius lutensis. (Bangs.)	340

B. †**Cynomyanax.**

524. Putorius nigripes. Aud. and Bach.	335
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C. **Arctogale.**

525. Putorius cicognani. (Bon.).....	344
<i>Putorius cicognani richardsoni.</i> (Bon.)	344
<i>Putorius cicognani alascensis.</i> Merr.	344
526. Putorius streatori. Merr.	345
527. Putorius muricus. Bangs.	434

528. ‡ Putorius alleghenensis. Rhoads, <i>Proc. Acad. Nat. Scien. Phil.</i> , 1901, p. 751.	
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Type locality. Beallsville, Washington County, Pennsylvania.

Geogr. Distr. Only known from Washington and Allegheny Counties, Pennsylvania.

Genl. Char. Size small, somewhat larger than *P. rixosus*. "Skull broader and flatter with interorbital space high, tumid and constricted posteriorly. No supra-orbital ridges."

Color. Summer Pelage. Upper parts and limbs walnut brown; under parts white. Lower foreleg and feet white; hind feet white on toes. Tail like back, walnut brown, tip blackish.

Winter Pelage. Pure white; blackish and brown hairs at tip of tail.

Measurements. Total length, 175; tail, 22; hind foot, 20.

* Citation of these two papers were inadvertently omitted in the Synopsis.

† Nec ωναζ sed, ανα, αναζ. = Cynomyanax.

‡ Published after the Synopsis.

	PAGE.
529. Putorius rixosus. Bangs.	345
<i>Putorius rixosus eskimo.</i> Stone.	345
530. Putorius arcticus. Merr.	345
<i>Putorius arcticus kadiacensis.</i> Merr.	346
531. Putorius noveboracensis. DeKay.	346
<i>Putorius noveboracensis notius.</i> Bangs.	346
<i>Putorius noveboracensis occisor.</i> Bangs.	347
532. Putorius washingtoni. Merr.	347
533. Putorius peninsulæ. Rhoads.	347
534. Putorius longicaudus. (Bon.).....	348
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535. Putorius spadix. Bangs.	348
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538. Putorius alleni. Merr.	349
539. Putorius xanthogenys. (Gray.).....	349
<i>Putorius xanthogenys oregonensis.</i> Merr.	350
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540. Putorius frenatus. (Licht.).....	350
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541. Putorius haidarum. Preble.	351

Sub. Fam. III. **Lutrinae.**

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542. Lutra canadensis. (Kerr.).....	352
<i>Lutra canadensis lataxina.</i> F. Cuv.	352
<i>Lutra canadensis vaga.</i> Bangs.	352
<i>Lutra canadensis pacifica.</i> Rhoads.	353
<i>Lutra canadensis sonora.</i> Rhoads.	353
543. Lutra degener. Bangs.	353

87. Latax. Gloger, 1827.

544. Latax lutris. (Linn.).....	354
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Order VIII. **Pinnipedia.**

Fam. I. **Otariidae.**

88. **Eumetopias.** Gill, 1866.

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545. **Eumetopias stelleri.** (Less.) 355

89. **Zalophus.** Gill, 1866.

546. **Zalophus californianus.** (Less.) 356

90. **Callotaria.** Palmer, 1892.

547. **Callotaria ursina.** (Linn.) 357

Fam. II. **Trichechidae.**

91. ***Trichechus.** Linn., 1766.

548. **Trichechus rosmarus.** Linn. 358

549. **Trichechus obesus.** Illig. 358

Fam. III. **Phocidae.**

Sub. Fam. I. **Cystophorinae.**

92. **Macrorhinus.** F. Cuv., 1824.

550. **Macrorhinus angustirostris.** Gill. 359

93. **Cystophora.** Nills, 1820.

551. **Cystophora cristata.** (Erxleb.) 360

* Three genera have been employed for the Walrus: **Rosmarus**, applied to it in the sixteenth century by Gesner, &c.; **Odobænus**, Linnaeus in 1735, and **Trichechus**, Linnaeus in 1766. For those who take the 12th edition of the *Systema Naturae* as the starting point, there is no difficulty about a selection, for **Trichechus** is made to include both Walrus and Manatees, and as **Manatus** was taken for a genus of Sirenians, **Trichechus** naturally becomes the term for the Walrus. It is those who reject Linnaeus' more matured and completed edition of 1776, and select that of 1758 for their starting point, that trouble begins, and they are obliged to search for a generic term. In the 10th edition **Trichechus** includes the Manatees, and the Walrus is placed among the seals in **Phoca**. The edition of 1735 offers **Odobænus**, passing over, however, to reach it, **Rosmarus**, employed for the Walrus, as stated, in the sixteenth century, and used generically by Klein in 1751, and Scopoli in 1777. Authors have at various times employed all of these terms, and there has been much discussion as to which should be preferred, but no agreement has been reached, and there is not likely to be any until it is finally decided and accepted generally which edition of Linnaeus shall be the starting point, and how many years previous to that shall genera be recognized, and what authors shall be authorities for them. At present it would seem that the advocates for the 12th edition have the best of the argument, for there appears no doubt as to their genus for the Walrus, **Manatus** having been eliminated, and as it may be said that probably the majority of Naturalists still employ **Trichechus**, it would seem more advisable to continue that term, the one finally adopted by Linnaeus himself, and also the one most familiar to all, than to select either of the others with their contested claims.

Sub. Fam. II. **Phocinae.**

94. Halichoerus. Nills, 1820.

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95. Phoca. Linn., 1758.

A. Erignathus.

553. Phoca barbata. Fabr.	362
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B. Histriophoca.

554. Phoca fasciata. Zimm.	362
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C. Phoca.

555. Phoca vitulina. Linn.	363
556. Phoca largha. Pall.	363

D. Pusa.

557. Phoca hispida. Schreb.	364
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E. Pagophilus.

558. Phoca groenlandica. Fabr.	364
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Order IX. **Insectivora.**

Fam. I. **Soricidae.**

Sub. Fam. I. **Soricinae.**

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<i>Sorex personatus streatori.</i> Merr.	367
<i>Sorex personatus *misciv.</i> Bangs.	376
560. Sorex richardsoni. Bachm.	368
561. Sorex tundrensis. Merr.	368
562. Sorex sphagnicola. Coues.	368
563. Sorex fumeus. Miller.	369
564. Sorex macrurus. Batchelder.	369
565. Sorex setosus. Elliot.	369

* Misplaced in the Synopsis.

	PAGE.
566. <i>Sorex vagrans</i> . Baird.	370
<i>Sorex vagrans dobsoni</i> . Merr.	370
<i>Sorex vagrans monticola</i> . Merr.	371
567. <i>Sorex amoenus</i> . Merr.	371
568. <i>Sorex vancouverensis</i> . Merr.	371
569. <i>Sorex nevadensis</i> . Merr.	371
570. <i>Sorex obscurus</i> . Merr.	371
<i>Sorex obscurus longicaudus</i> . Merr.	372
571. <i>Sorex glacialis</i> . Merr.	372
<i>Sorex glacialis alascensis</i> . Merr.	372
<i>Sorex glacialis shumaginensis</i> . Merr.	373
572. <i>Sorex bairdi</i> . Merr.	373
573. <i>Sorex trowbridgii</i> . Baird.	373
574. <i>Sorex montereyensis</i> . Merr.	373
575. <i>Sorex ornatus</i> . Merr.	374
576. <i>Sorex californicus</i> . Merr.	374
577. <i>Sorex shastensis</i> . Merr.	374
578. <i>Sorex tenellus</i> . Merr.	374
<i>Sorex tenellus nanus</i> . Merr.	375
579. <i>Sorex longirostris</i> . Bachm.	375
580. <i>Sorex fisheri</i> . Merr.	375
581. <i>Sorex pacificus</i> . Baird.	375
582. <i>Sorex pribilofensis</i> . Merr.	376
583. * <i>Sorex merriami</i> . Dobson.	376

97. *Microsorex*. Baird, 1857.

584. <i>Microsorex hoyi</i> . Baird.	377
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98. *Neosorex*. Baird, 1857.

585. <i>Neosorex palustris</i> . Richards.	378
<i>Neosorex palustris navigator</i> . Baird.	379
<i>Neosorex palustris alaskanus</i> . Merr.	379
586. <i>Neosorex albibarbis</i> . Cope.	379
587. <i>Neosorex hydodomus</i> . (Dobson.)....	379

99. *Atophyrax*. Merr., 1884.

588. <i>Atophyrax bendirii</i> . Merr.	381
<i>Atophyrax bendirii palmeri</i> . (Merr.)....	381
<i>Atophyrax bendirii albiventer</i> . (Merr.)....	381

* Possibly an Old World shrew. See MERR., N. AM. FAUN., No. 10, 1895, p. 89.

100. Blarina. Gray, 1837.

	PAGE.
589. Blarina brevicauda. (Say.)	382
<i>Blarina brevicauda carolinensis.</i> (Bachm.)	383
<i>Blarina brevicauda hulophaga.</i> Elliot.	383
<i>Blarina brevicauda peninsulae.</i> Merr.	383
590. Blarina telmalestes. Merr.	384

A. Cryptotis.

591. Blarina parva. (Say.)	384
592. Blarina floridana. Merr.	385

101. Notiosorex. Baird, 1877.

593. Notiosorex crawfordi. (Baird.)	385
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Fam. II. Talpidae.**Sub. Fam. I. Myogalinae.****102. Neürotrichus.** Gunth., 1880.

594. Neürotrichus gibbsi. Baird.	387
<i>Neürotrichus gibbsi major.</i> Merr.	387
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NOTE.—As this List is going to press the following description is received:

Didelphys marsupialis texensis.

D. m. texensis. Allen, Bull. Am Mus. Nat. Hist., 1901, p. 172.

Type locality. Brownsville, Texas.

Geogr. Distr. Neuces Bay southward, and Rio Grande Valley as far as Del Rio, Val Verde County.

Differences from *D. marsupialis* consist in: "relatively longer tail, longer nasals. usually terminating posteriorly in an acute angle."

Measurements. Total length, 698-820; tail, 255-410; tarsus, 58-73.

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